Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

OCT 14 1940

Improved-

by the use of

Gravity Discharge

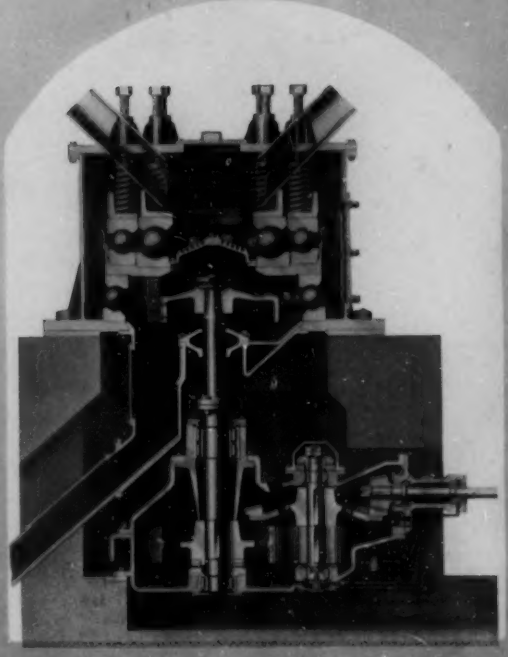
The new gravity discharge from the pulverizer, incorporated in the B&W Closed-Circuit System, makes possible the grinding of raw material and clinker with less maintenance and lower power consumption. A major moving part—the sweep—has been eliminated.

Details of this improved grinding method gladly furnished upon request.

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET . . NEW YORK, N. Y.

C-35

B & W
Closed-Circuit System
for
Raw Material
and
Clinker Grinding



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LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

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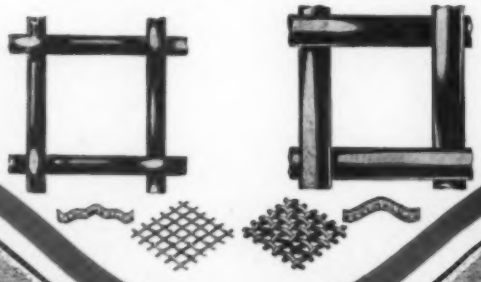
CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer

endure vibration better

resist fatigue to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave. The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving. Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY
SAINT LOUIS

Behind EVERY MARION
ARE THESE WELL KNOWN FACTS
● Ample power reserve and stamina for profitable performance in rock or ore.
Plenty of speed and capacity to insure maximum yardage in the toughest digging.
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OCT 10 1940

NEXT MONTH'S ISSUE

THE EDITORS of ROCK PRODUCTS do considerable traveling, not only to see new plants in the industry and new processes applied, but for a larger and no less important purpose. That is to interview MEN whose thoughts and acts have important bearing on the present and future. Those men are not necessarily engaged in these industries; because, after all these industries are a part of all American industry, which is closely interwoven and tied together.

The editors of **Rock Products** not only preach the advantages of industrial association membership—indeed it is a necessity these days when patriotism must be organized to be effective—but they practice what they preach. **Rock Products** is a member of the industrial association of its own journalistic field of activity—has been for more than twenty years—and its editors are members of a national association of business and industrial journal editors.

Through these associations the editors of **Rock Products** keep in close touch with all developments which their particular industries should know about. So this month the editor of **Rock Products** will interview the Premier of the Dominion of Canada and several members of his cabinet who are responsible for national defense there, just as he has, with his brother editors, interviewed the President of the United States and members of his cabinet.

Such interviews are confidential, but they are given for the express purpose of keeping the editors of the business and industrial press fully informed on events and plans that vitally affect all industry. Most of that information is passed on to readers of these business and industrial journals in some form, because the things learned that will prove helpful to their country and to their respective industries become a part of the mental equipment of the editors who are privileged to attend these interviews.

The editors of **Rock Products** are moved "to toot their own horns" to this extent because it is doubted that the average reader of a business and industrial journal appreciates the constant efforts being made, day in and day out, year in and year out, to garner every bit of information that can prove useful to him in his business.

Eliminate Soft Stone

Soft stone is undoubtedly one of the biggest problems in the aggregates industry but one large producer has successfully eliminated this cause for rejecting shipments by careful crushing, using the latest type of equipment developed for this purpose.

Pumps and Gravity

"Dry land dredge" methods are used by a sand and gravel producer in handling materials at the plant by means of pumps and gravity. After scalping out the large stone, the material is pumped from a sump to a sand tipple at the top of the plant where the sand is removed by a gravity screen and dewatered and cleaned in a screw washer. The gravel goes to a vibrating screen for sizing. Oversize is chuted to a crusher and the product goes back to the sump for recirculation by pump.

ROCK PRODUCTS

RECOGNIZED THE WORLD OVER AS THE LEADER IN ITS FIELD

With which has been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 43, No. 10

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LIME BURNING

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FOR
CEMENT

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FOR ORES, PHOSPHATES, ETC.

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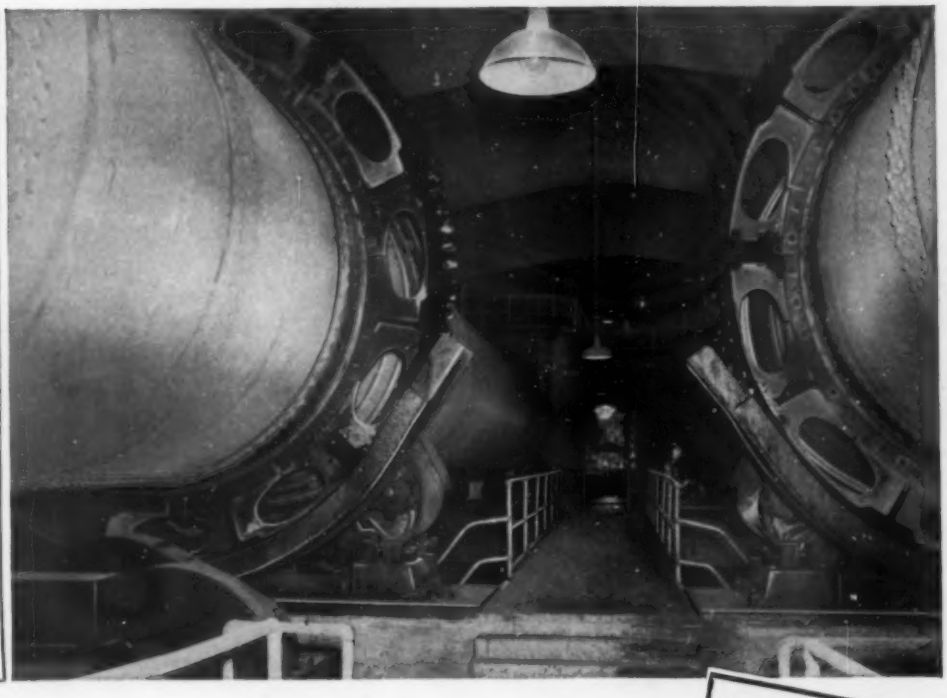

PRODUCING portland cement from oyster shells, the Pacific Portland Cement Co. has been keeping friction losses and upkeep costs to a rock bottom figure. Open gears on their kilns, oyster shell dryers and clinker coolers have shown less wear, and required practically no attention.

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Made in all sizes — lengths up to 50 feet

It DOUBLED their suction hose life

EIGHTEEN MONTHS was the maximum service being obtained from sand suction hose in a large midwestern operation. The hose just collapsed from extreme wear and abrasion at the severe bend, shown in this photograph.

In May 1936 a length of Goodyear Style M Sand Suction Hose was put in this line on recommendation of the G. T. M.—Goodyear Technical Man. It remained in service until August 1939 before failing—a total of 39 months' wear, or *more than twice as long as any previous hose.*

Needless to say the replacement was another length of Goodyear Style M Hose. In fact, all suction lines are now 100% Goodyear-equipped. The company estimates that the longer life of Goodyear hose has cut their hose cost in half!

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BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

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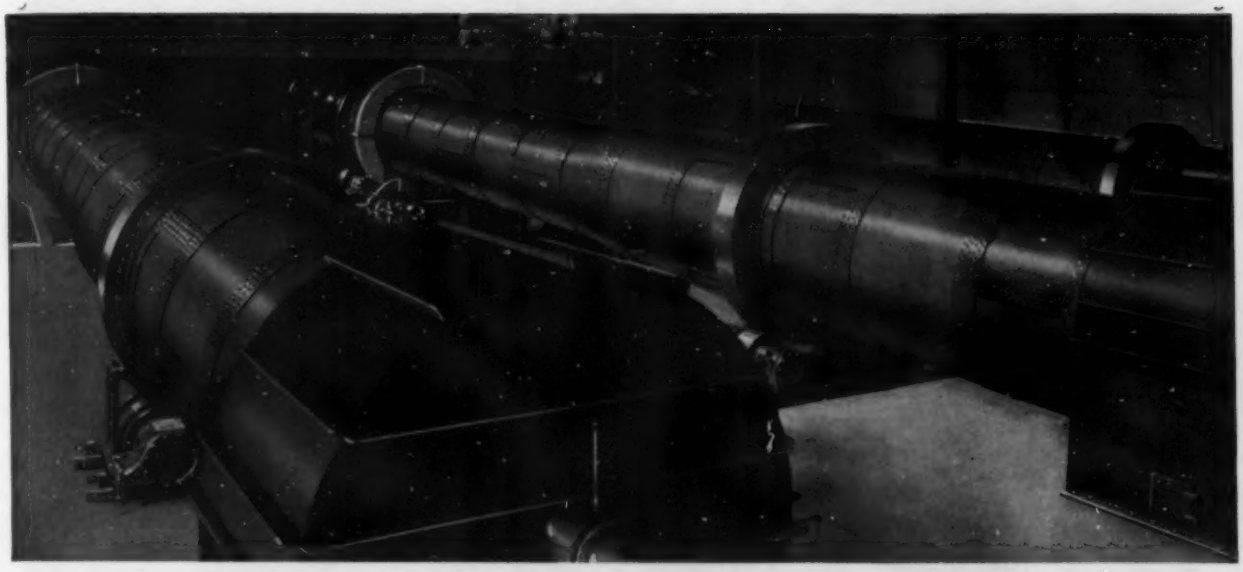

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Buyers from Traylor are always assured of "tomorrow's" Rotary Kilns, Coolers and Dryers, because we are always alert to make improvements in design to meet the advance of science more than half way, and we are particularly insistent upon the finest of workmanship in our shops. Yet we manage to keep the purchase price comparable with that of ordinary equipment!

We maintain better-than-usual facilities for the assistance of cement and lime manufacturers, in working out their problems, and we are always anxious that they be used. Write us today.

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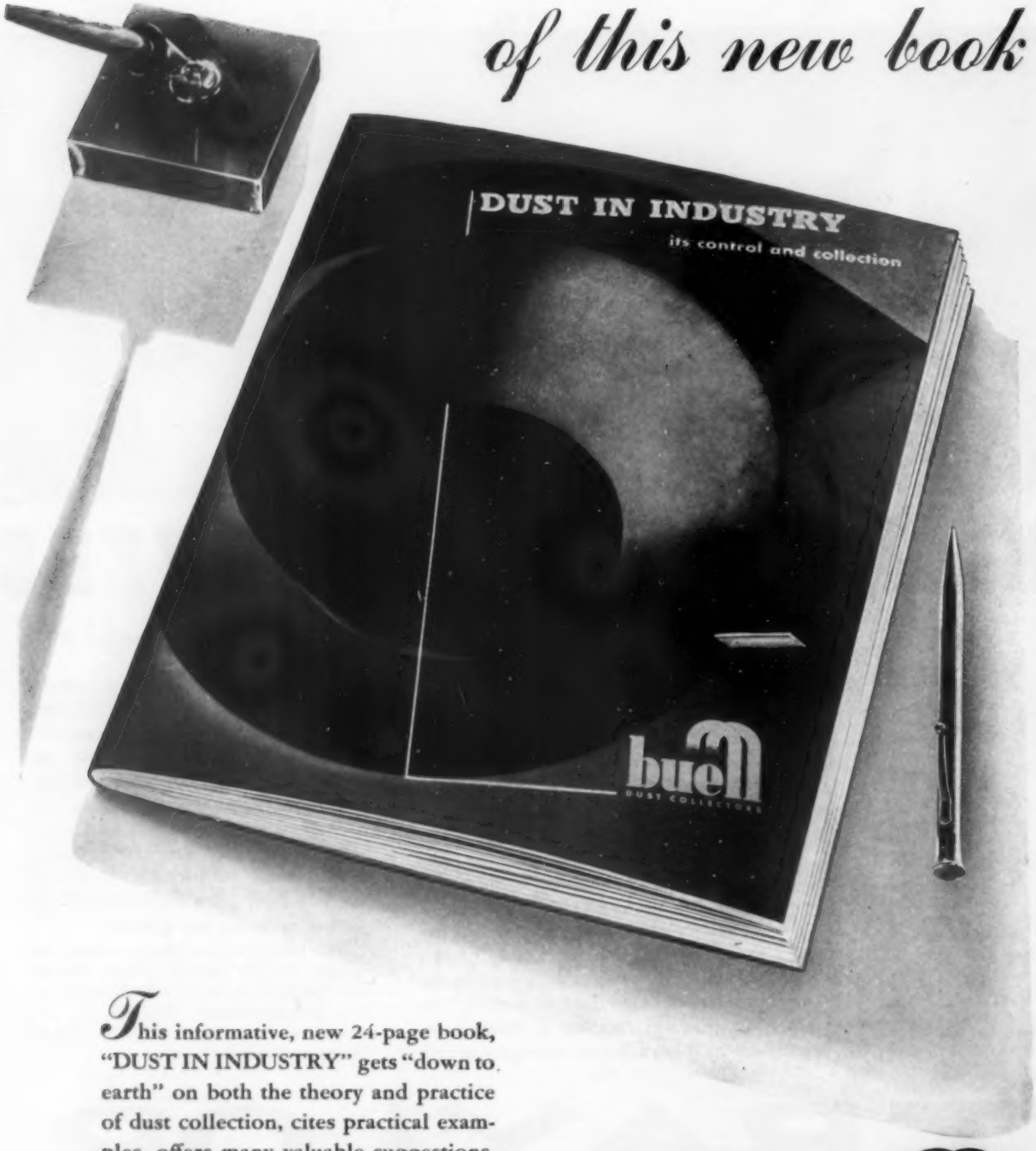

This informative, new 24-page book, "DUST IN INDUSTRY" gets "down to earth" on both the theory and practice of dust collection, cites practical examples, offers many valuable suggestions. A copy will be sent any executive or engineer upon request. Just write BUELL ENGINEERING CO., INC., Suite 5000, 2 Cedar Street, New York, or B.F. STURTEVANT CO., Hyde Park, Mass.

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In thousands of industrial plants, in municipalities and mines, on ranches and construction projects, Fairbanks-Morse Diesels are slashing deeply into accepted power costs. It is not unusual for these dependable Diesels to cut power costs as much as 50%!

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The AIRVEYOR

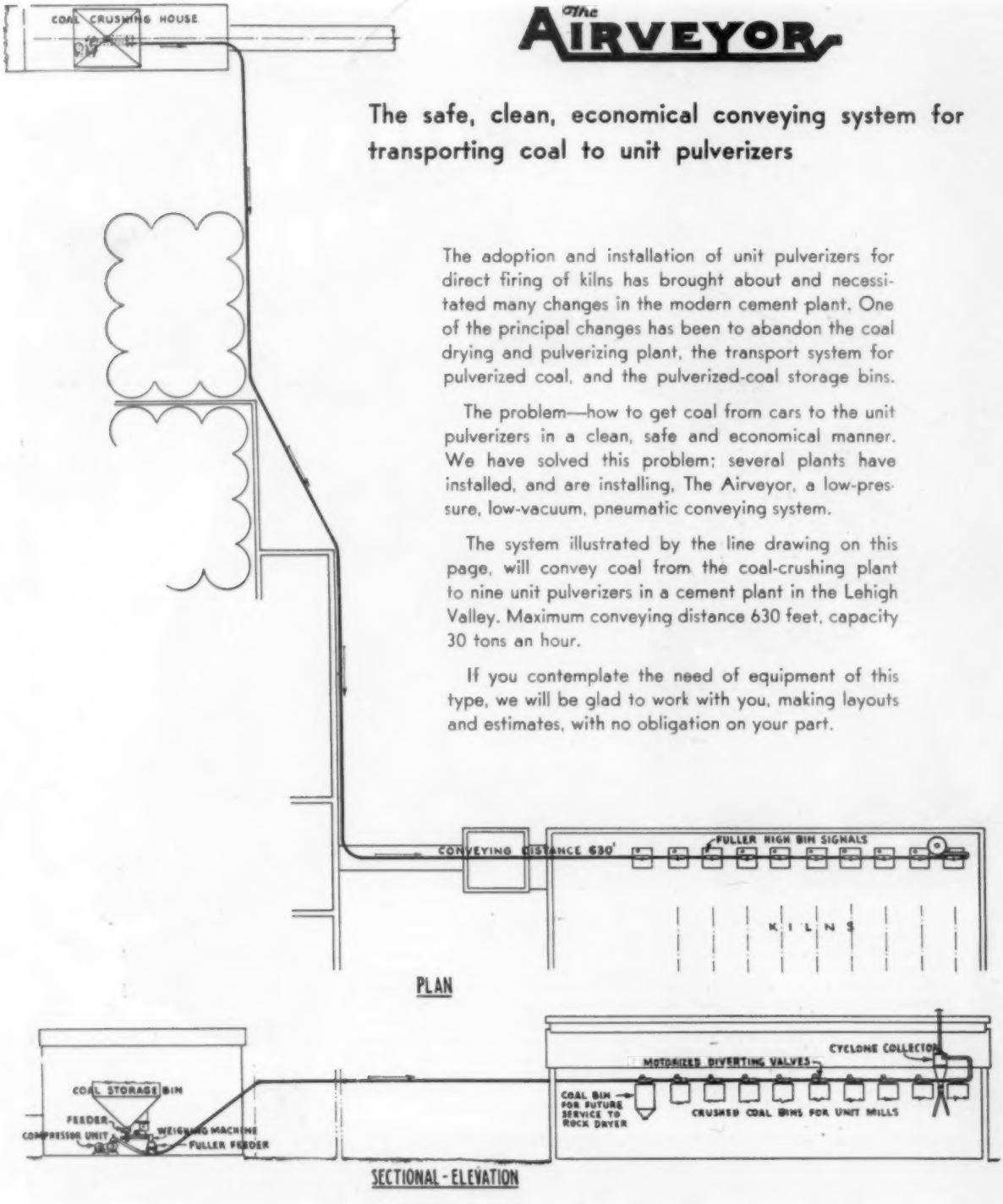
The safe, clean, economical conveying system for transporting coal to unit pulverizers

The adoption and installation of unit pulverizers for direct firing of kilns has brought about and necessitated many changes in the modern cement plant. One of the principal changes has been to abandon the coal drying and pulverizing plant, the transport system for pulverized coal, and the pulverized-coal storage bins.

The problem—how to get coal from cars to the unit pulverizers in a clean, safe and economical manner. We have solved this problem; several plants have installed, and are installing, The Airveyor, a low-pressure, low-vacuum, pneumatic conveying system.

The system illustrated by the line drawing on this page, will convey coal from the coal-crushing plant to nine unit pulverizers in a cement plant in the Lehigh Valley. Maximum conveying distance 630 feet, capacity 30 tons an hour.

If you contemplate the need of equipment of this type, we will be glad to work with you, making layouts and estimates, with no obligation on your part.



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"GULF PERIODIC CONSULTATION SERVICE has helped us improve production and reduce maintenance costs"

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Please send my copy — no charge — of the booklet "GULF PERIODIC CONSULTATION SERVICE."
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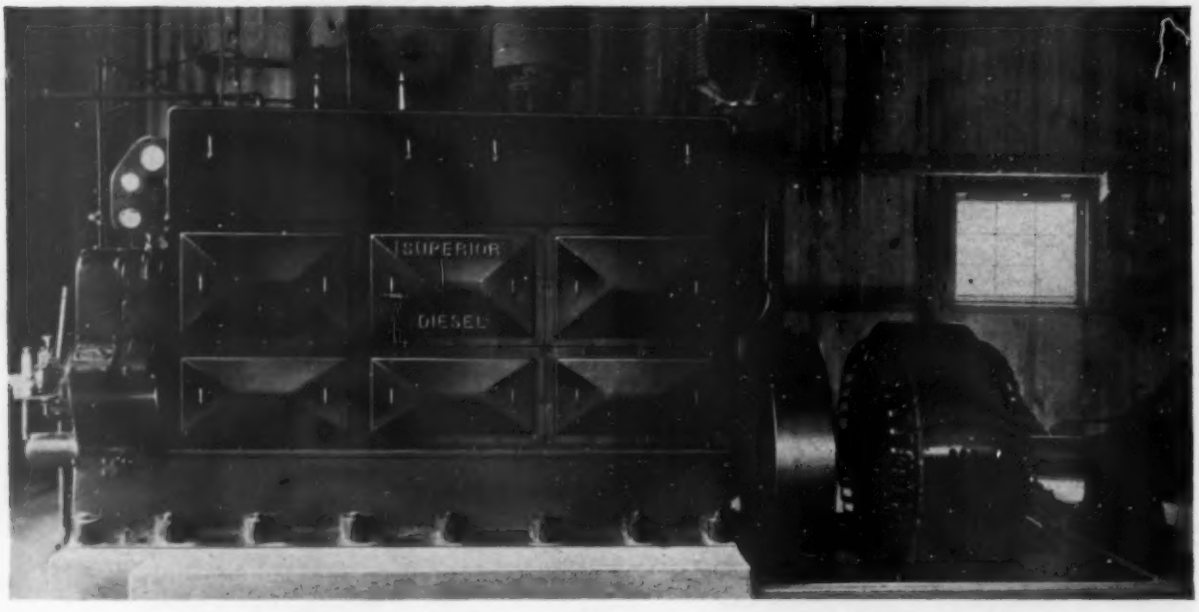
DOWN GOES POWER COST 75%



Simple Superior Diesel installation provides all electrical power and lights needed by Howellsville Quarry, Howellsville, Penna.

. . . AND NO DEMAND CHARGES IN WINTER AFTER *Superior* DIESEL GOES TO WORK

Many northern quarries cannot operate all winter and many cannot afford high demand charges for an occasional day or two of operation. That is one good reason for Diesel power.

A still more important reason is the year-round saving which this owner says amounts to 75% on every ton of stone crushed.

Any interested power user may learn what a Superior Diesel can do for him, by making a simple request for the information, which does not obligate in any way.

There are so many prospects for Superior Diesels that we have no hesitancy in advising those who are not just as conscientiously and cheerfully as those who are.

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

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PIONEER

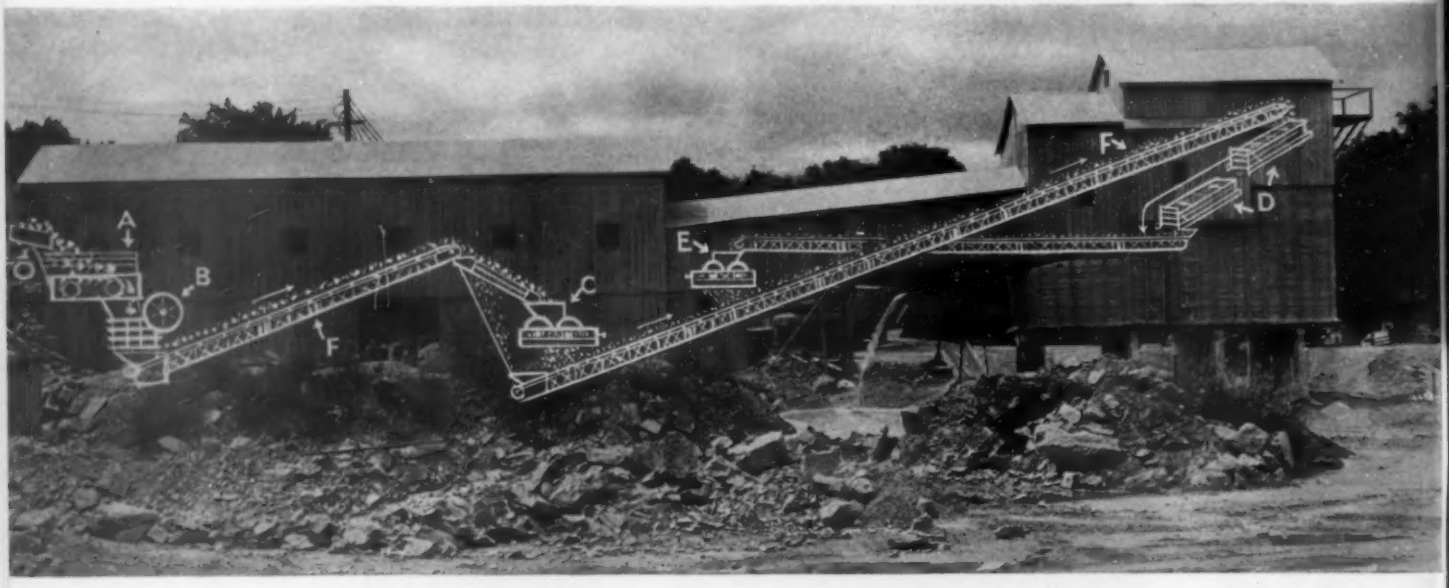
Foto Facts

No. 9

Paul Frank, operating a large commercial quarry in North Vernon, Indiana, had several problems to solve:

1. *To take shovel size stone.*
2. *To increase production.*
3. *To control production of each size.*
4. *To change produce sizes without changing screens.*
5. *To produce dry and washed materials simultaneously.*

QUARRY PLANT *produces* WASHED ROCK and DRY "AG" STONE



Here's How Paul Frank Solved His Problems:

First, he consulted with Pioneer engineers and discussed his troubles and requirements. Then he made the following changes and additions to answer each of his problems:

1. To take shovel size stone, he installed a Pioneer Traveling Grizzly Feeder (A) and a Pioneer 24"x36" Primary Jaw Crusher. (B) The grizzly feeder takes the big rocks without man-handling, by-passes the small materials, and feeds a constant regulated flow to the Primary Crusher. The 2436 Primary Crusher takes any rocks the shovel will handle.

2. To increase production, he installed a Pioneer 54"x24" Roll Reduction Crusher (C). With the Primary Crusher set at 5" the 54" Roll Crusher will reduce the entire output down to 1⅜". It will handle wet sticky materials without plugging or delay. It has large capacity and a large "stage of reduction".

3. To control the percentage of each size produced, Paul Frank installed a Pioneer 40"x22" Roll Crusher (E) and arranged his screens so that any excess size could be conveyed to this Roll Crusher and reduced to a smaller size.

4. To change sizes, he equipped his second Vibrating Screen (D) with 1¼" opening in the top deck and ¾" in the second deck. When producing 1¼ to ⅛ the produces passing both decks go into the bunker. When producing ¾ to ⅛ a gate in the spout diverts the 1¼ to ¾ and it goes to the 40"x22" Roll Crusher (E) for further reduction.

5. To produce dry agricultural limestone and washed rock simultaneously, he arranged to dry screen out the fines in the first screen and do all the washing on the lower screen. This helps to keep the dust cloth clean and eliminates doughballs in the finished product.

The result is an efficient, well-balanced plant and the new items purchased were not an expense but an investment that has paid large regular dividends.

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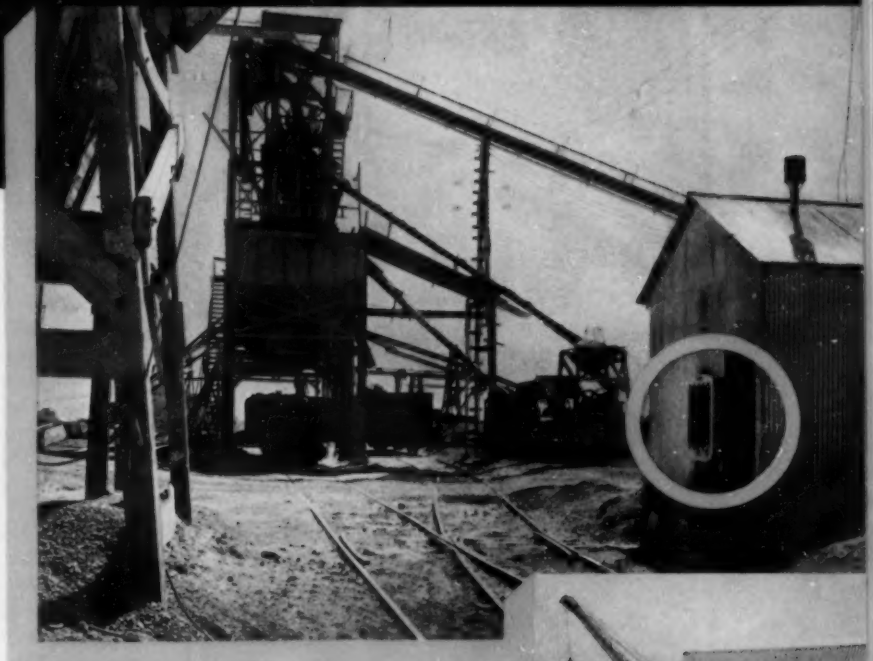
1515 Central Avenue, Minneapolis, Minn., U. S. A.

SAVING

$2200.00 a year!



By driving its entire plant with a "Caterpillar" Diesel Engine, the Fordyce Gravel Co., of Pharr, Texas, has cut its annual power-cost from four thousand dollars to *only eighteen hundred!*

Low consumption of low-cost fuel does it . . . and so does "Caterpillar" Diesel long-life, heavy-duty construction which holds the cost of maintenance-repairs to a minimum!

Profits come from *savings* as well as from sales—when "Caterpillar" Diesel Power drives your plant. See your nearest "Caterpillar" dealer, or write direct to the factory today, for specifications that will fit your set-up!

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

• The Sullivan City (Texas) plant of the Fordyce Gravel Co., which is powered entirely by a "Caterpillar" Diesel D13000 Engine driving a Westinghouse generator. Engine uses only about 5 gallons of 4-cent fuel an hour!

• Another "Caterpillar" Diesel Engine owned by the Fordyce Gravel Co. This one is 7 years old — and has run a total of 21,000 hours! Repairs, in all that time, are estimated at only $275. Belted to a generator, this engine powers a 1¼-yard electric shovel which handles 120 yards an hour. Engine uses only 3 gallons of low-cost fuel an hour!

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No metal-to-metal contact in grinding

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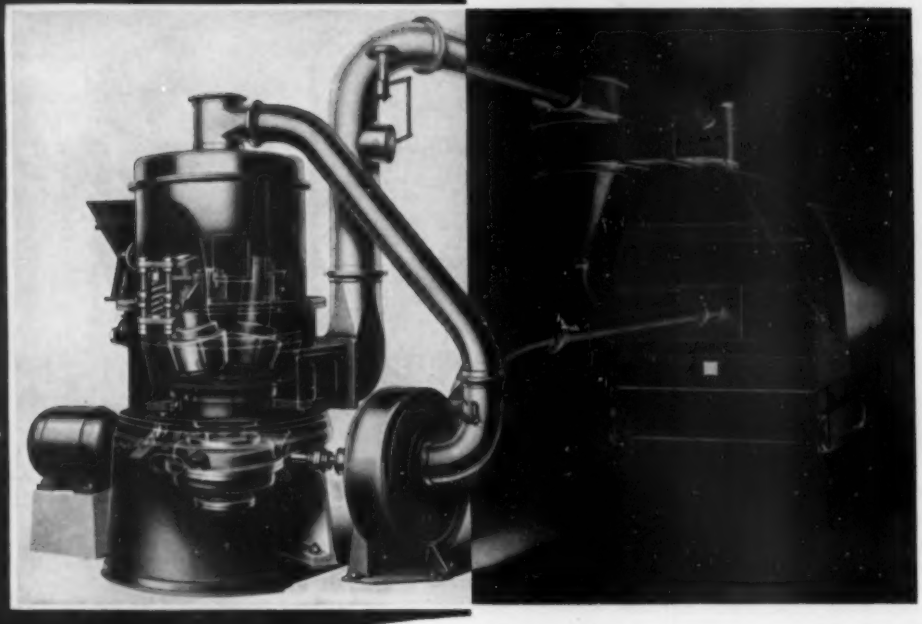

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For peak efficiency in operation. Panel board includes all controls for pressure, draft and rate of feed and provides complete graphic record of mill performance.

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How far advanced in efficiency is this modern direct-firing unit?

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Easy, external adjustments. Self-circulating oiling system.

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Has Everything!

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GREATER RANGES 21-ft. boom and 18-ft. stick coupled with Center Drive design, which places shipper shaft at center of boom, increases the Lorain-69's operating ranges to a new high for 1¼-yd. shovels.

EASE OF OPERATION Vacuum control of crowd, retract and travel clutches, swing clutches and crowd brake makes for smooth, effortless operation, yet retains the normal feel and flexibility of clutch response and action.

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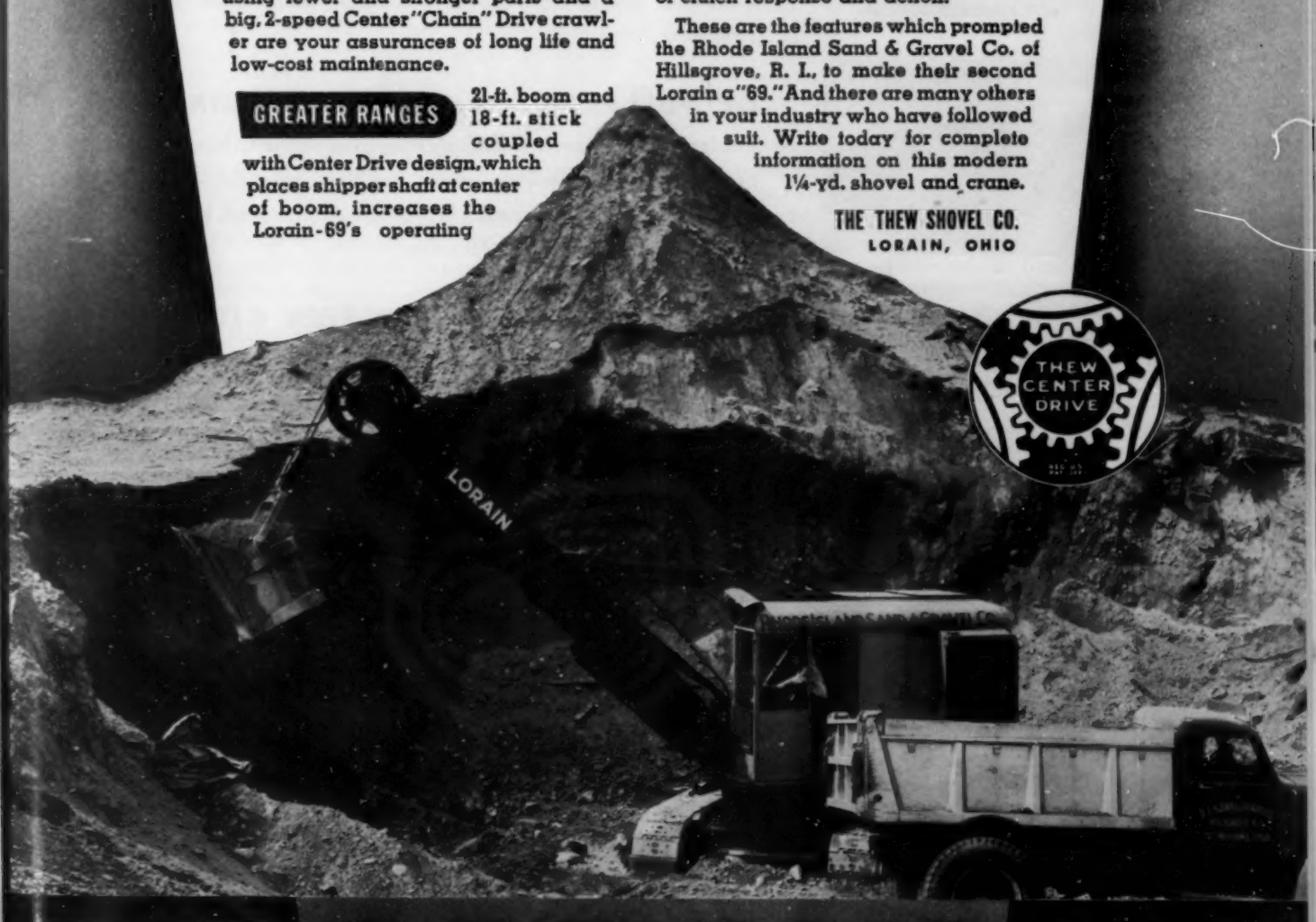
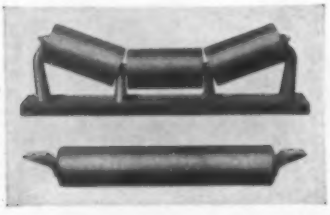


1¼ YD. LORAIN 69

WITHOUT INTERRUPTING PRODUCTION YOU CAN . . .



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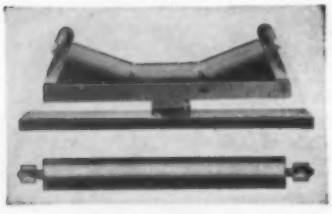

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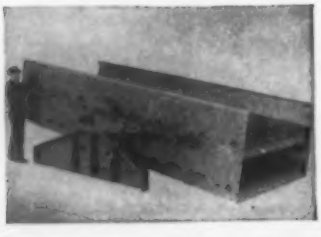

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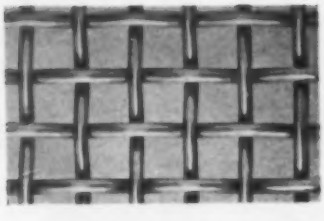

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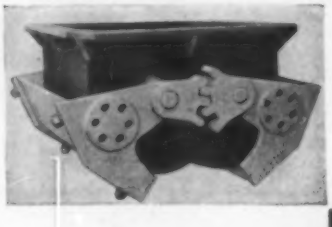

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THERE MUST BE A LID ON PRICES

ONE has only to look through the pages of other industrial journals such as *Engineering News Record*, *Iron Age*, etc., to see that we are on the threshold of a tremendous volume of new plant construction and plant expansion construction. With the steel industry already operating at ninety-odd percent capacity, and a shortage of skilled workmen, it does not require a prophetic eye to see that demand in many lines may soon exceed supply.

That seems inevitably to point to price increases all along the line, and price increases once thus started lead to inflation. It is doubtful if any fifth column attempt of a European dictator can ruin this country half so quickly or so completely as another period of inflation like that of the last World War and its aftermath. It must be avoided if it is humanly possible to do so.

Our esteemed contemporary, J. H. Van Deventer, editor of *Iron Age* in a warning editorial on "Preparedness and Prices" says:

"Inflation can be avoided in only one way; by keeping prices down. Every business man will accept this statement as a truthful generality but some will say 'our case is an exception.'

"Friends, in the necessity of avoiding price rises during the coming months, there are no exceptions. It is a matter of self preservation for you to avoid price rises and to discourage them elsewhere."

We editors of a few leading industrial journals know from the President's own lips that he is probably more concerned with this threat of run-away prices and inflation than any other immediate domestic problem. He realizes that he needs the coöperation of every business man. We may be sure too, that the government will attempt to meet the problem with all the powers it possesses, except possibly one, and that is to keep demands for increased wages within bounds.

Increased prices always result in demands for increased wages; and thus is started that vicious cycle of increased costs, increased prices, increased wages and more increase in costs. Our experience with it is altogether too recent and too disastrous for any one to fail to recognize its symptoms. The concern of the President is only too well founded, and his desire for the coöperation of business men is genuine.

But will he use the same possible strong-arm methods that he is trying to apply to business men to labor also? Possibly, if he achieves election to a third term and his ambition is satiated, and he does not look forward to a fourth and a fifth term. He may then ask for the coöperation of labor in terms that mean he intends to get it.

We have no quarrel with his desire to maintain the gains that labor has made in collective bargaining, shorter work days and minimum wages. We know of few if any employers who begrudge these, whether they be Republicans, Democrats or New Dealers. For the President to tell labor as he has that all these blessings would be thrown overboard, if he is not retained to watch over them, shows abysmal ignorance of the real attitude of employers generally, unparalleled egotism, or downright deceit.

On the other hand, labor by working on defense projects many more hours at time-and-a-half and double-time is going to have money to spend comparable to that in the days of 1917-18 World War activity—that frenzied, silk-shirt era! Who of us who lived through it have forgotten! It is labor itself that will largely start the cycle of increased prices by reckless purchases of consumer goods, resulting in increased living costs, increased wages, etc., etc. Yet the President has not asked labor to do its share to hold down prices; and very possibly he won't.

Were his education and philosophy different the President would urge all who benefit from this bulge in earnings to be thrifty and save against the day of reckoning. Instead he assures them that their benevolent government, provided he stays at the head of it, will always take care of them and provide both leisure and plenty.

The burden of protecting your workmen and yourself against another disaster, worse even than that this country has just passed through, rests squarely on the shoulders of you business men and employers. As business men, you may expect little help from Washington in educating workers, probably only revilement; but this country is ours and not that of a relatively few who now run the government.

There will be a natural reluctance to applying the maxims of thrift, as well as active encouragement of unthriftiness by word and act of the President. Experiences of millions in the loss of savings very recently certainly have shaken their faith in the maxims of thrift; but it was gambling by people and institutions to whom they entrusted their savings not their own thrift, which caused their troubles. It is the duty and obligation of all of us, that faith in thrift be restored, and a sound way out of our national economic difficulties be adhered to, in spite of Washington leadership, or the lack of it.

Nathan C. Rockwood

NEWS AND COMMENT

Profits Embarrassing

EVERY MANAGER of a business knows it is embarrassing to himself and subordinates to have to go before a board of directors and report "no profits"; it now appears, from the experience of a West Coast cement manufacturer, that it is equally embarrassing to the manager to have to report a profit. The company we have in mind, like many another, went through long periods without profits; but in a few fortunate years with capacity production made very substantial profits. Last year was one of these. As a result of these profits, which of course are well known, since there are many local stockholders, the company's employes are threatening to strike for an increase of 9c per hour, on a present minimum rate of 72½c per hr. Apparently, the only thing preventing a strike (when this was written) was the fact that the company has U. S. government contracts which can be interpreted as coming under defense works. When these contracts are filled there apparently is not enough business in sight to insure a very prolonged production period.

Chemical Industry Taking Bulk of Lime

REFLECTING the expanding activity of the chemical industry, shipments of lime in this division during July amounted to 72,951 tons of quicklime and 18,919 tons of hydrate out of a total of 158,122 tons in all classifications. The National Lime Association also reports that the building industry obtained 34,472 tons of hydrate and 19,243 tons of quicklime. Shipments for agricultural use totalled 11,387 tons of hydrate and 1150 tons of quicklime. Ratio of shipments to capacity in July, 1940, amounted to 53.9 as compared with 54.2 in June, and 44.4 the same month a year ago.

Utility Errors

BACK in the halcyon days of the roaring 1920's it was not uncommon for public utility companies to go to extraordinary efforts to get customers. For example, Samuel Insull's Public Service Company of Northern Illinois bought quarries and gravel pits in order to sell them power; another sub-sub-subsidiary Central Illinois Public Service Co. also owned and operated a quarry. A very similar kind of public utility organization was the Associated Gas and Electric Co., whose original home territory was New York State.

The A. G. & E. Co. owned an electric railway in order to have a customer, and the electric railway in order to have a shipper, owned a lime and limestone plant and quarry at Jordanville, N. Y. It was operated for 10 years at an aggregate loss of $428,000. Lately it has been operated under court order by the General Crushed Stone Co., which is reported to have made an offer of $21,000 for its purchase. This little story is surely an interesting commentary on the power industry of the 1920's and on the kind of competition it gave its customers in every branch of industry.

W. P. A. Quarries

MUCH INTEREST has been expressed in the news item on p. 98 of the August issue of ROCK PRODUCTS in which it was stated that "all city and county stone quarrying (W.P.A.) projects (in Toledo, Ohio) have been ordered shut down permanently . . . on the ground that the activity tends to compete with private industry." So much interest was shown that J. R. Boyd, administrative director of the National Crushed Stone Association, was moved to issue a special letter on the subject. Mr. Boyd did not mention ROCK PRODUCTS; and he also did not quote the news item correctly. The news item did not give any reader cause to believe that the order was a general one applying to all projects everywhere. So far as the item went, and so far as the editors of ROCK PRODUCTS know, it applied only to Toledo, Ohio, and the county it is in.

Readers who have read ROCK PRODUCTS consistently will doubtless recall that these particular projects have certain features, which while not unique, are not common. When these W.P.A. things started, a lot of local quarry projects—wherever stone was easily obtainable—were in the picture. There were scores of them in Ohio. The France Stone Co., Toledo, having various idle plants, as did all other Ohio quarry operators, suggested to the city and county authorities that instead of going out and opening up new quarries, that they put their W.P.A. "workers" in the company's quarries and plants. The company would provide expert supervision and facilities. A contract was made by which the company was paid on a tonnage basis for the use of its facilities and supervision, and for royalty on stone removed.

Whether this cost for stone furnished the city and county was all the price the officials charged themselves isn't clear, from newspaper reports, but we presume that is the case, since they say the stone cost them only 65c per ton. The federal government of course paid the W.P.A. labor, so it was not a city or county expense. To buy the same stone commercially produced, they say will cost $1.10 per ton.

The W.P.A. under Col. Harrington is reputed to be making an earnest and honest attempt to prevent unfair competition of W.P.A. quarrying and gravel-pit projects with private industry. This of course is as it should be and is an end that both the National Crushed Stone Association and the National Sand and Gravel Association have worked toward since the establishment of the W.P.A. There is not, however, any general order to close up such projects; and the news item referred to did not so imply. We do know, however, that individual producers who have been able to prove unfair competition beyond reasonable doubt have received consideration from Col. Harrington's office and have had competing W.P.A. operations closed.

Construction Reaches Ten-Year High

A TEN-YEAR RECORD for the construction industry was hung up in August this year when the 37 States east of the Rocky mountains reached a total of $414,941,000 in contract awards, according to a recent report of the F. W. Dodge Corporation. Residential building contracts awarded totaled $152,988,000, largest since July, 1929, and 20 percent more than in August, 1939. Public construction contracts increased to $195,293,000 from $158,459,000 in August, 1939. Private construction showed an even larger gain, advancing to $219,648,000

from $153,869,000 a year ago. Manufacturing building awards were $39,586,000, nearly four times larger than for the same month in 1939.

A substantial portion of this increase is attributed to expansion resulting from defense orders. Thomas S. Holden, vice-president in charge of statistics and research, F. W. Dodge Corporation, reports, "The impetus given to construction by the defense program has just begun to be felt." It also must be remembered that these figures do not include the very large defense projects on the West Coast and the island possessions of the United States.

Screenings Bring in Big Contracts

THE EDITOR:

I read with interest your fine article on the Pennsylvania Turnpike in the September, 1940 issue, and note you have one small paragraph entitled, "What Will Be Done With Screenings?" I thought you might be interested in knowing what has been done with screenings in this area during the past summer.

What with the Queen Elizabeth Way, a four-lane highway 40-odd miles long, and the vast number of airport runways being built under the Empire air training scheme, the stone producers have had a very busy season. But in order to get these jobs they have had to supply screenings in such quantities that it finally developed into: if you had the screenings, you could get the order for the stone. These screenings were used for a sub-base under the concrete runway or road, I presume acting as a pad or cushion. Many quarries have sold out old stockpiles that have been accumulating for years, so it is quite possible these Pennsylvania producers eventually will get rid of theirs for a similar class of work; that is, if and when your Federal government expands airport facilities.

I might also state that the Queen Elizabeth Way was completely paved with concrete in some 40-odd days, which we over here consider a road paving record.

I also noticed in the paving of this roadway, something new to me; that is, after the base of screenings was graded, it was carpeted with tar paper and the concrete placed on top. I presume this was for the purpose of preventing moisture being drawn from the concrete and thus giving a better cure to the bottom of the slab.

ROSS HEAD, President
Hamilton Builders Supply, Ltd.
Hamilton, Canada

Hold Down Prices

THE PRESIDENT has emphasized coöperation with business and industry to prevent spiraling price increases. The agreement made by the National Defense Advisory Commission with the paper pulp industry to hold down prices has been quoted as an example. At the same time the Assistant Attorney General says a closer policing of industries to prevent violation of the anti-trust laws is necessary; and news reports say 3000 individuals in business and industry are already under indictment. This is interesting because it used to be considered by legal experts that a combination or agreement to maintain or lower a price was just as much a violation of the law as an agreement to raise prices. Evidently the President is again advising violation of laws his assistant attorney general has been instructed to enforce. Incidentally, the National Gypsum Co. and one of the largest lumber companies have assured the trade that their prices will not be increased.

The Big Boss

BACK IN OLD NEW ENGLAND, when the editor was a boy, it was always the skin-flint farmer-banker, who had mortgages on his neighbors farms and chattels, who was the local political boss. When we stop to think that Uncle Sam, as represented by our New Deal Government, has 10 billion dollars in mortgages on his nieces' and nephews' real estate alone, we can readily understand that Uncle Sam, as represented by our New Deal Government, really does have some little influence on election results. It takes 42,000 U. S. Government employes, with a payroll of 90 millions and a traveling expense account of 3 millions a year to take care of this mortgage business; and it is not only not a prosperous business but one that probably will result in several billion dollars' loss.

Fixed Coal Prices

UNLESS there is another postponement (there have been many before) the Guffey Coal Act prices go into effect October 1. The schedules are so complicated that no one understands how to arrive at them—and very few producers or users have any idea the law can be made to work. Anyhow, it means at least a temporary increase in price to most users. In the city of Chicago alone, it is estimated users will pay $3,000,000 more a year.

It will be a further help of course to the oil and natural gas producers. And as long as oil and gas last and coal prices increase, the coal industry will not be benefitted. Nor is the cause of society in the United States served by measures which encourage using up our resources of oil and gas, for these are far less than our resources of coal.

The importance of the portland cement industry as a fuel user is illustrated by the construction of a natural gas pipe line, 62 miles long, to serve the Calaveras Cement Co. in California. The estimated cost is $500,000 to serve this one customer only. The company is said to spend nearly half that sum annually for oil.

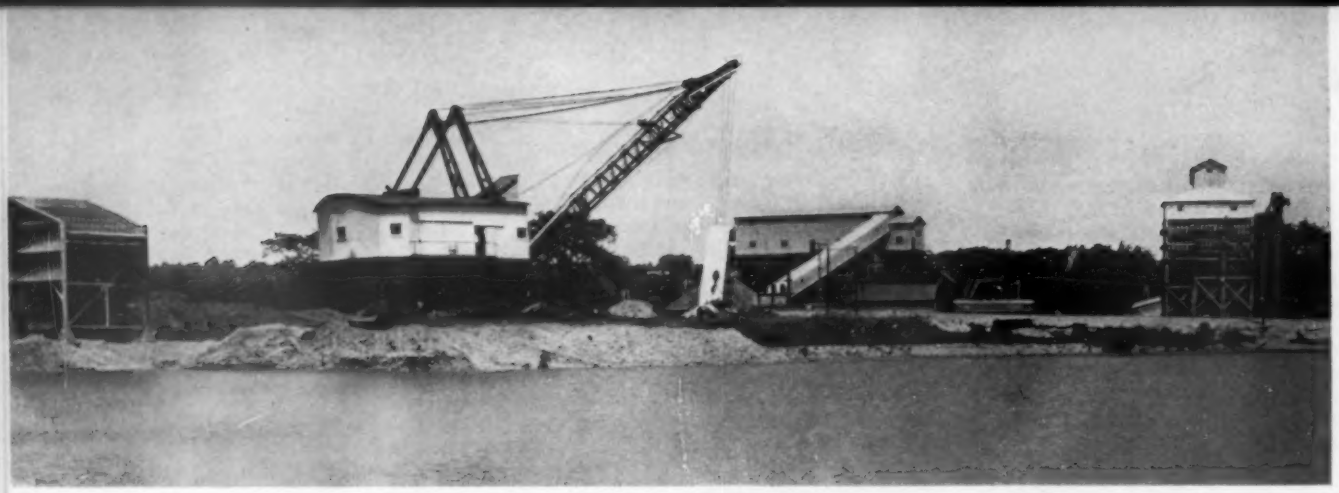
Cement Plant By-Products

DR. READ VINTON, professor of mining engineering at Columbia University, was a recent visitor at the Permanente Corporation's new cement plant in California. He is quoted by a local newspaper as saying that though the main product is and will be portland cement, the company will also produce lime and limestone for beet sugar factories, concrete aggregates, including stone sand, and possibly eventually dry ice and potash from stack dust.

HENRY J. KAISER gave the cement industry a jolt when he built a 10,000-bbl. a day mill in their midst; he did a number of things in his own way, and now he may be pioneering in a diversification of cement-plant products. A few other cement manufacturers make lime, but only one that we know of besides Permanente makes lime and cement in the same kilns, or the same plant. Other products or by-products have been made at cement plants, but apparently not profitably. Maybe Mr. Kaiser can show 'em how.

Industry Picking Up

THERE are many signs of returning prosperity in the rock products industry; one of them being mergers. In the cement industry two old line companies, noted for their success, have acquired as new properties, two going producing companies. These expanders are the Marquette company which has acquired the Hawkeye at Des Moines, Iowa, and the Ideal, which has acquired the Gulf at Houston, Texas. Other mergers are said to be in the air.



General view of plant and under-water deposit. From left to right: Field hopper, dragline for excavating material, main plant, and loading bins to the right

Blending Ten Aggregate Sizes On Long Tunnel Conveyor

Plant does not require large productive capacity with extensive storage facilities

By FRANK M. WELCH*

ABOUT SIX YEARS AGO the American Aggregates Corporation exhausted the deposit at their Dublin Road gravel plant located in Columbus, Ohio. Therefore, after nearly 30 years operation, this unit was discontinued.

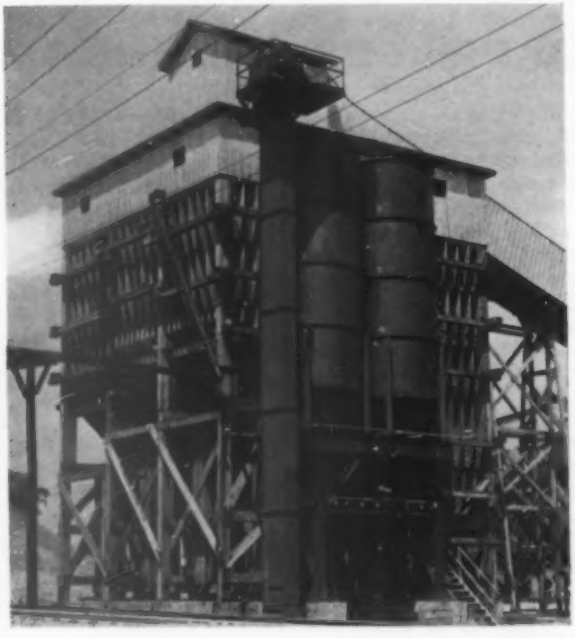
During the latter years of this operation, the company acquired the Dublin Road Golf Course under which lays an extensive gravel deposit across Dublin Road and beyond Grandview Avenue from the old plant. This property has been and still is being operated as a going public links. However they have now completed a new and most modern sand and gravel plant on the eastern end of this tract which will gradually, over a long period, reduce the golf course area. This will be known as their Grandview plant.

As the Grandview location had no rail connections, the first move was to construct a railroad tunnel 700 ft. long, extending under both Dublin Road and Grandview avenue. This tunnel, which connects with their original siding, permits the same rail shipping facilities that they had at the original plant. On the other hand the new plant is equipped for far more extensive truck shipping than the old one.

The new operation may be considered a very large plant when measured from the standpoint of storage capacity. Its hourly tonnage, however, of say 200 tons, is more in keeping with present demands. The extensive storage is all on the ground and served by tunnel conveyors. It not only includes compartments for three sizes of round gravel, four sizes of crushed gravel and three of sand, but also an extensive pile of active raw material storage and several stocks of special products adjacent to the main plant.

Raw material is excavated mostly from under water by a Class 24 Bucyrus dragline and hauled to a track hopper in center-dump ore cars, handled by a Diesel locomotive. There are

*Manager, F. M. Welch Engineering Service, Inc., Greenville, Ohio.



Close-up of loading out bins showing construction details

Loading bins to the left, main plant to the right and sand settling basin in foreground. Note that all conveyors are covered

no track grades steeper than 1½ percent and no curves sharper than 6 deg. The ore cars were rebuilt to haul gravel by extending the sides upward with 15-inch channels, increasing the capacity from 33 to 45 tons.

Underneath the track hopper a rotary feeder serves a 30-in. belt conveyor, 160 ft. centers, which deposits the raw material on to a pile holding 1600 tons of active ground storage and about three times that amount of emergency storage. A steel box type tunnel underneath the raw storage pile contains another rotary feeder serving the 30-in. plant conveyor, 180 ft. centers.

Tunnel Conveyor Below Storage Handles Ten Sizes

The plant proper consists of ten bulkheads separating the various ground storage piles of finished product and supporting the screening and washing plant above. Close to one side of the bulkhead storage is the crushing plant on the ground, and underneath is a concrete tunnel 6 ft. 6 in. square equipped with 24 undercut segment gates which feed any grade of round or crushed material or sand in any proportion desired, on to a 30-in. tunnel conveyor, 285 ft. centers.

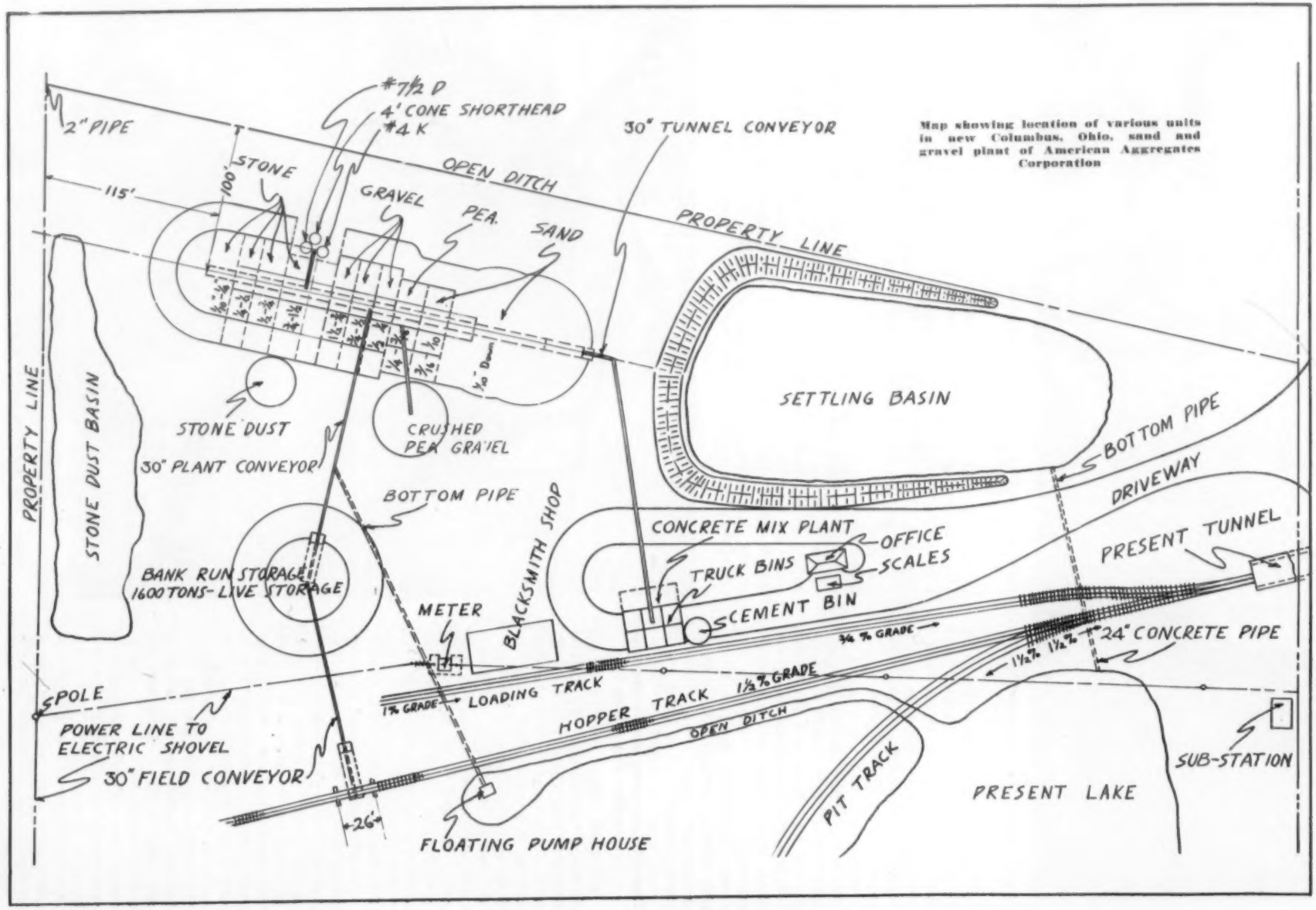
The 30-in. plant conveyor from raw storage feeds a 60-in. diameter by 23 ft. triple-jacketed, revolving washing and scrubbing screen. The oversizes from this screen pass to a 7½D Allis-Chalmers primary crusher, a 4K Allis-Chalmers crusher and a 4 ft. Symons shorthead cone crusher. The 1½-in. to ¾-in. gravel is discharged direct to a storage compartment while the rest passes by belt conveyor and flumes to vibrating screens for further refinement and grading. Smaller sized gravels and coarse sands reach storage piles directly from the vibrating screens, while the ⅒-in. down sand passes to a 4- x 5- x 23-ft. sand drag to produce concrete sand. The sand drag discharges on to a 24-in. boom conveyor, 53 ft. centers, which extends up and over to permit a more extensive pile of concrete sand than any of the other sizes.

Overflow from the sand drag empties into an 8- x 20-ft. stationary settling tank for reclaiming the necessary fines. These fines are pumped in just sufficient amounts from the bottom of this tank to an automatic sand tank located over and discharging on the boom conveyor. This method of assuring the required percentages of fines in concrete sand was successfully developed at this company's south Columbus plant.

All crushed material from the primary and secondary crushers is re-elevated to the top of the plant by a 14- x 27-in. super capacity elevator where two Simplicity triple deck vibrating screens produce four grades of crushed gravel. The resulting stone dust is flumed to a large settling basin 125 ft. away. One of these screens may be operated dry, permitting the production of dry stone dust. A 24-in. x 50-ft. hinged boom conveyor dis-

Above: Main screening and storage plant just completed and before any material has been processed. Note heavy concrete supporting piers over tunnel conveyor.

Below: Raw material conveyor and raw storage pile about one-third full



Map showing location of various units in new Columbus, Ohio, sand and gravel plant of American Aggregates Corporation

charges the stone dust and also ¾-in. crushed material, including dust, on to separate piles for meeting existing markets.

The plans also include the future installation of an impact crusher under the discharge of one of the vibrating screens where pea gravel will be reduced to chips. These chips or crushed pea gravel will be conveyed on a boom similar to the one described above, to a separate pile in the yard for truck loading.

The 30-in. tunnel conveyor discharges any size or combination of product on to a 24-in. x 190-ft. loading conveyor which extends to the top of the loading bins. At this point, it discharges over a vibrating rinsing screen into any one of three 160-ton gravel bins, one 160-ton concrete sand bin, one 180-ton pea gravel bin, one 180-ton masons sand bin or three 200-ton crushed stone bins. In front of the gravel and sand bins are two steel cement bins, having a capacity of one car each. They are charged through a centrifugal discharge elevator and screw conveyors from a pit underneath the loading tracks.

The stone bins are equipped for direct truck loading only. A 4-cu. yd. weigh hopper is located under the four concrete aggregate bins, and also a cement weigh hopper for batch loading in addition to direct truck loading. A small hopper is also installed under the pea gravel and masons sand bins to expedite accurate loading of these commodities. Side bin gates are installed on the track side of the bins for car loading. By virtue of a turnhead at the discharge of the loading conveyor, cars may also be loaded direct from this point.

Washing water for the entire plant is furnished by two 8-in. centrifugal pumps located in a floating pump house in a basin tributary to the main lake. An additional 4-in. pump at the same location furnishes water when only the rinsing of stock materials over the loading bins is required. The waste water from all sand settling tanks is flumed to a large settling basin which overflows to the main lake. By the time this basin becomes filled with solids, the main lake will be sufficiently excavated to serve this purpose.

Diesel locomotive used to switch cars to and from main line track. C. E. Glander, district manager for the company at Columbus, Ohio, is standing at the left

A 30- x 60-ft. blacksmith and repair shop is conveniently located adjacent to the main driveway behind the loading bins. About 75 ft. in front of the loading bins is an ample office and truck scales.

The accompanying map shows the compactness, convenience and flexibility of the entire lay-out with the driveway from Grandview Avenue past the office and under the bins, and the loading tracks from the bins to the rail tunnel under the streets.

Convert Interurban Car Into Diesel Locomotive

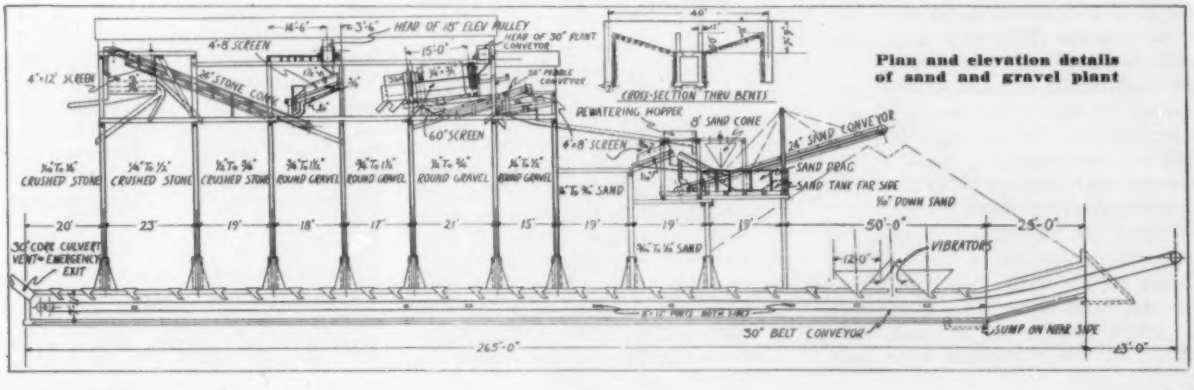
The conveyor idlers and driving machinery, the stone elevator, the revolving washing screen, the sand drag and settling tanks and all hoppers, spouts and gates were furnished by the Greenville Mfg. Works. Four Simplicity vibrating screens and one Allis-Chalmers low head screen are used. Conveyor belting was supplied by Goodyear.

Of the new equipment, probably the most interesting feature at the Grandview plant is the Diesel locomotive. This unit was assembled and built in the shops of the American Aggregates Corporation, known as the Greenville Mfg. Works, at a relatively small cost.

A car was picked up from one of the many abandoned traction lines. This car, already equipped with a motor on each axle, was about 12 ft. longer than necessary. After cutting a section out of the center the car was put back together and reinforced to make a shorter and sturdier locomotive. A 250-hp. Cummins Diesel engine,, together with generator and other necessary accessories, was mounted inside to complete a unit which is highly satisfactory and efficient in every way.

The above is the second similar unit built by this company, the other now being in use at their south Columbus plant. They are now building a larger locomotive containing duplicate engine and generator units for use at one of their Michigan operations, where steeper grades occur and greater loads must be handled.

The main office of the American Aggregates Corporation is in Greenville, Ohio. The new Grandview plant is in direct charge of Mr. C. E. Glander, Columbus district manager.



Plan and elevation details of sand and gravel plant

What Does Control Prices?

More Comments by Rock Products Producers

CONTINUING the discussion of the editorial in the June issue of ROCK PRODUCTS "Why Not Discuss an Economics of Business?" we have letters from several presidents of producing companies to add to those on pages 46 and 47 of the July issue.

After some of the adverse comments already published the following from the president of a large cement company was gratifying:

"I have read with considerable interest your letter and the editorial in which you have discussed a subject which to my knowledge has had very little, if any, free discussion or consideration. I do not feel qualified at this time to comment on the merit and practicability of the philosophy advanced although I think you stated your view clearly and convincingly."

Depreciation Charges Are Flexible

The president of a company producing both sand and gravel and crushed stone writes:

"Most of your discussion centers around the matter of annual depreciation and depletion charges and it is very true that these are a problem. Undoubtedly it would be helpful to outfits in the rock products production business to be able to base depreciation charges on the volume of business done.

"Of course, depletion charges are regulated to a considerable extent by volume of business. However, they are so small, under the regulations of the Internal Revenue Department, that they do not constitute a very important factor.

"I do not believe that it would be too difficult a matter to get the Internal Revenue Department to consent to a variable scale of depreciation, adjusted to the annual sales tonnage. In fact, I have discussed this with some Income Tax men and none have been averse to the idea.

"This, of course, would help insofar as Income Taxes are concerned, by reason of the fact that it would allow a corporation to save up expenses to be charged off in large volume, large profit years.

"Most of the other portions of your discussion are a little bit too heavy for me. The expectation which you set forth in the third paragraph, I would classify as a hope. Also, prices in my experience have been absolutely controlled by competition and I see no other way out, at the present time. The fact that this competition is more or less irresponsible does not affect the result in any way. Therefore, irrespective of the correctness of the principle, conditions are the ruling factor at this time and I can see no hope of a change."

Needed Revision of Anti-Trust Laws

The president of another sand and gravel company who is a real student of economics contributes the following:

"I should like first to refer to the status of our laws, and particularly interpretations thereof, restricting free and frank and open discussion among businessmen. Many of us find it very difficult to believe that the framers of our original anti-trust statutes, either Federal or State, had even faintly in mind restrictions similar or comparable to what have come about. Obviously most of us are not lawyer enough to pursue this matter to any very valuable conclusion. This much, however, a lot of us do feel competent to say: The theory and principles involved in a legitimate effort to curb trusts, combines and collusion do not require the drastic restrictions now being enforced, and particularly those restrictions against the fullest possible discussion of all kind of details among any group of businessmen, provided only that they do not result in fact in collusive agreements and promises affecting future business. Whether the desired results must be had through legislation or may be anticipated on more liberal and sympathetic court decisions is a question that I cannot answer.

"Now with reference to your specific suggestion that producers should 'write off a unit cost in inverse ratio to volume.' It is, as you say, an entirely new suggestion in the form you have put forward. Nevertheless a similar line of thought is followed by almost all lines of business with reference to plant repairs and overhauling which may be legitimately charged to expense rather than capital. In years of slack production nearly all producers do as a matter of fact defer considerable of this work and propose to pick it up when production or production prospects are more satisfactory. 'Deferred maintenance' is a frequently used term and is not limited to our industries but is more or less common to all businesses operating plant facilities. Nor is the decision to defer such maintenance always, nor even most often, based on the owner's ability to pay for it. It is more frequently the sound preference to curtail outgo unless present or prospective income looks satisfactory. It seems that in principle this course of action concurs in your suggestion of writing off investments more liberally in prosperous years and less rapidly in lean years.

"When it comes to establishing any sort of uniform practice similar to your case of producer 'A' and producer 'B' two obvious difficulties arise at once in the stone, sand and gravel industries:

"First a fair estimate of productive capacity and the percentage of such capacity currently used. Most of us in recent years have operated in 'fits and starts.' A big job will come along in reach of us and we will be busy for a few weeks or months, then drop back into the trough. A sustained record of actual full time production in our industries is about the only way to determine actual capacity. A theoretical capacity rating of the actual installation is worth almost nothing because it is influenced, not to say controlled, by too many other factors.

"The second difficulty would be in securing the adoption by producers of such "write off" policies and anything approximating a dependable execution or following out of the practice without check-up conferences which would undoubtedly run afoul of our laws as currently interpreted.

"The editorial is certainly interesting and at least has the value of being thought provoking, and similar discussions might lead us to something very helpful in stabilizing investment values."

The president of a large gypsum products company writes as follows:

"I think the editorial contains some very sound philosophy. This is another approach to the problem. From a practical standpoint we know that reasonable security for the principal must be shown to justify capital necessary for new industry, improvements and extensions, and I believe this is something the country is suffering from under existing conditions.

"Certainly we have some very practical examples today where the government is prosecuting an industry in which over the past five years average income to the investor has not been attractive. When the govern-

(Continued on page 33)

Relieving Conveyor By Adding Crusher

New sand and gravel plant designed to handle a large number of boulders by using ample crushing capacity. Produces accurately graded sand with classifiers

By L. D. H. ANDERSON*

General view of plant. In foreground is conveyor from primary crusher feeding scalping screen with reduction crusher below. In background is conveyor taking material to the final screening plant

MUCH INTEREST throughout New England is being shown in the gravel plant built by the Crystal Concrete Corp. at Braintree, Mass. Ample justification of this interest is found in the fact that it is located in the highly competitive Boston market and that it achieves much lower production costs through installation of more modern equipment, better suited for the exacting conditions found in the particular gravel bank.

The Crystal company is controlled by Thomas H. Hannaford, an operator of wide experience, not only in the ready mixed concrete field but also in gravel production for a still longer period. The company completely covers greater Boston with its varied services. Acquisition of the gravel bank dates back to the time when it became obvious that foresight was necessary to assure a large deposit near Boston where the then current reserves were rapidly dwindling. Two previously operated banks of this company had been largely depleted.

This and the growth of the company necessitated construction of the new plant a few months ago. By gradual process of elimination, by drawing on this particular operator's experience and that of many others, and a very thorough study, a plant was evolved that has more than justified the preliminary work.

Close-up showing location of three sand classifying tanks and storage bins below over concrete tunnel

Like practically all others in New England the deposit is of glacial origin which means that wider ranges of sizes of stone are found. In this particular bank were found even larger boulders than usual, with also a higher percentage requiring crushing. The gravel stone itself is hard and remarkably free from disintegrating material. The deposit, covering an area of 117 acres, varies in depth from a few feet to almost 100, and is bordered by an artificial pond of a few acres. Clean washing water is obtained here. Discharge of waste water is to the lower end where most undesirable fines are carried away without sedimentation.

Excavation is done by two gasoline shovels, depending on capacity required and hauling distance, a 1¼-cu. yd. and a ⅞-cu. yd., Lorain. Hauling is by three 6-ton dump body Sterling trucks which discharge in a hopper over a bar grizzley below which is a 24-in. Telsmith reciprocating feeder. Special attention was paid to assuring fast truck maneuvers and dumping. The design provides for all forward movement for the trucks, eliminating the need for backing to the truck hopper to discharge.

Horizontal bars at roadway level reject gravel over 12-in. on the smallest dimension. These bars are of 80-lb. rail, inverted. Inclined grizzley bars below those mentioned retain the plus 5-in. gravel and chute it to the No. 13B Telsmith pillar shaft primary gyratory crusher. The size was selected for not only future additions to be made, but also to handle the larger boulders found.

The arrangement decided on, eliminates need for handling larger size boulders on either the primary belt conveyor or the scalping screen. Thus a bad practice is avoided; no excess load is put onto the scalper, an extra wide primary belt is not required, and the hazard of large stones rolling off the belt is eliminated.

Throughs from the 5-in. spaced, inclined grizzley are uniformly fed by the reciprocating feeder to the 30-in. primary belt conveyor, which also picks up the production from the 13-in. gyratory crusher.

This conveyor, like all others in the plant, is of a strong standardized steel truss design developed by the Anderson Engineering Co., with simplified, self-contained drives. Only two reductions are used in each head end, and these are of oversize-capacity, finished roller chain, fully enclosed and operating in an oil bath. The electric motors also are enclosed in the assemblies.

The depth of truss used is adequately supported when bents are

* Anderson Engineering Co., Cambridge, Mass.

Vibrating scalping screen above 8-in. gyratory secondary crusher

spaced as much as 40 ft. apart. This was one of the chief factors which determined the use of all steel conveyor frames and terminal equipment. Fewer supporting bents meant less yard obstruction, which was even more than ordinarily desirable, with the storage arrangement used.

The primary conveyor discharges onto a 4- x 10-ft. Telsmith vibrating screen. The location of the primary crusher permits use of a single deck scalper at this point. Here the minus 1½-in. stone goes to the main conveyor, the oversize to an 8B Telsmith gyratory crusher similar in design to the primary crushing unit, varying only as to size.

With a major market for 1½-in. maximum size stone this machine has been found to be ideally suited. Its product goes to No. 2 belt conveyor, also of steel frame design, which makes a closed circuit with the 8B gyratory crusher and scalping screen.

With this scalping screen, no stone over maximum size goes up the main belt. Thus a screen of less area, or fewer decks in the case of the vibrating type, satisfies production needs.

A 4- x 12-ft. triple deck screen is used for final sizing. Located at right angles to the main conveyor, and some distance from it, a launder is employed to provide a scrubbing action for best cleaning the stone, avoiding the use of a separate revolving scrubber. This was determined feasible by many tests on the material in various sections of the bank.

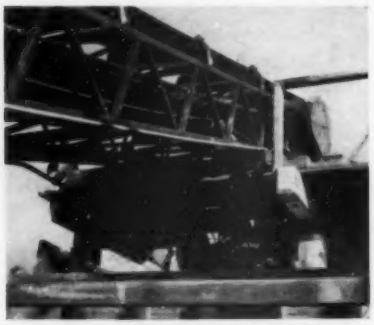
The bottom deck of this screen is divided unequally between two different sizes of screen cloth. The upper end is of a mesh size to produce plaster and masons sand. The lower end of this deck, and larger area, is of concrete sand size. Facility is provided for increasing or decreasing the amount of plaster sand produced, by a most simply adjusted baffle. This is also used to increase or decrease the percentage of fines in the concrete sand. At times it is arranged to divert all the fine sand to the concrete grade, producing a very high grade sand.

Inclined grizzley sends plus 5-in. gravel to 13-in. primary gyratory crusher

Plaster sand is flumed to a Telsmith No. 8 sand classifying tank. The larger grade of sand passes to two No. 8 classifier tanks. These three tanks are capable of operating without the addition of more water within them, the water introduced at the sizing screen being sufficient.

No desirable fines are wasted. Being of the straight-through-flow type, suitable sedimentation is easily accomplished and additional washing water need be employed only when an exceedingly large excess of fines must be eliminated from the raw material.

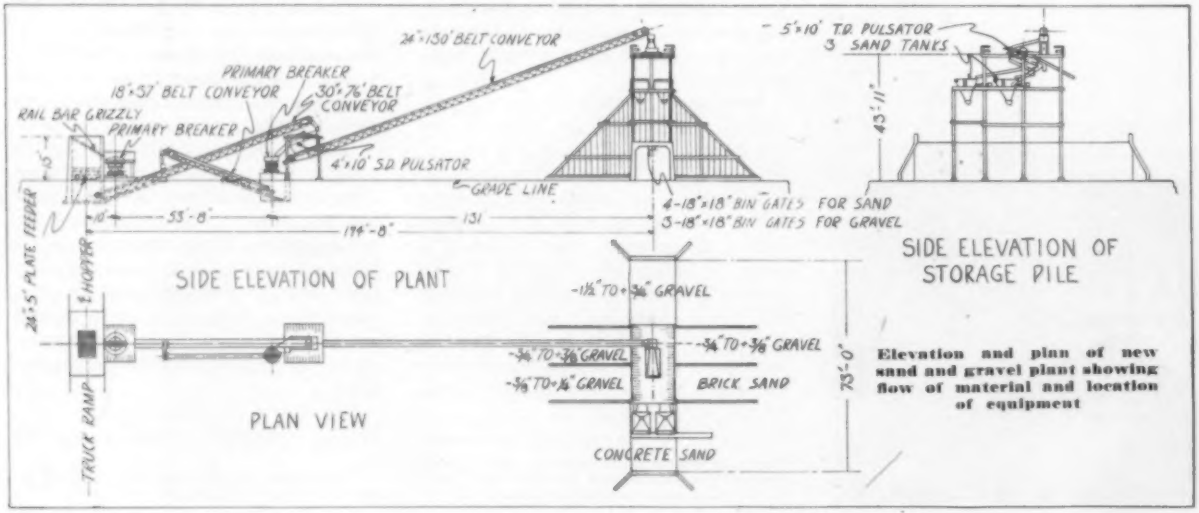
Discharges from the sizing screen and sand classifying tanks go to a most unusual if not unique combination of live and dead storage. Briefly, it involves a concrete tunnel 73-ft. long, not including the angularly extended wing walls. Six bulkheads divide the storage area transversely into



Head end of main conveyor showing enclosed drive and steel frame construction

five sections. The central part is divided longitudinally, providing separation at present for six sizes of product. The end sections, by far the largest, are used for the principal gravel size at one end and concrete sand at the other. The intermediate divisions provide one each for plaster sand and ¼-in to ⅜-in. gravel, with plus ⅜-in. minus ¾-in. in two pockets, one of which is frequently used for special specification size. Unusually large storage capacity is obtained

(Continued on page 47)



Elevation and plan of new sand and gravel plant showing flow of material and location of equipment

Keeping Old Quarry Up-to-Date

One of the oldest crushed stone companies in the Middle West changes methods and equipment to meet requirements for new products

By RALPH S. TORGERSON

F. W. Stolle

NEARLY A CENTURY AGO, Casper Stolle started in the quarry business in St. Louis, Mo., in 1846 to be exact, and the company is still going strong under the name of The Casper Stolle Quarry & Contracting Co. His sons, F. W. Stolle, president, and Carl A. Stolle, sales manager, continue the family traditions which have made the name well-known in the crushed stone industry.

Many changes have occurred in the business during the past 94 years, but the company has always been in the front ranks in changing their practices and plants to meet new conditions. For example, the company was one of the first to recognize the enormously potential market for agricultural limestone, and many years ago equipped their plant with fine reduction crushers to produce this product. Their father before them was one of the first to introduce bucket elevators and rotary screens. Since that time vibrating screens and other more modern equipment has been added.

This company also pioneered in establishing better relationship with its employes through improved living conditions. In the early days, quarry labor shifted from place to place and it was very often difficult to keep workmen steadily on the job. To improve this situation, the company built at the quarry a stone building with steam heat, electric light and modern bathing facilities which served for the single men as a dormitory, kitchen, dining room and commissary. Married men were housed in homes built near the quarry property. A better class of worker, more fixed in his living habits, has made it unnecessary to maintain this building as a dormitory and it now houses the superintendent and provides office space.

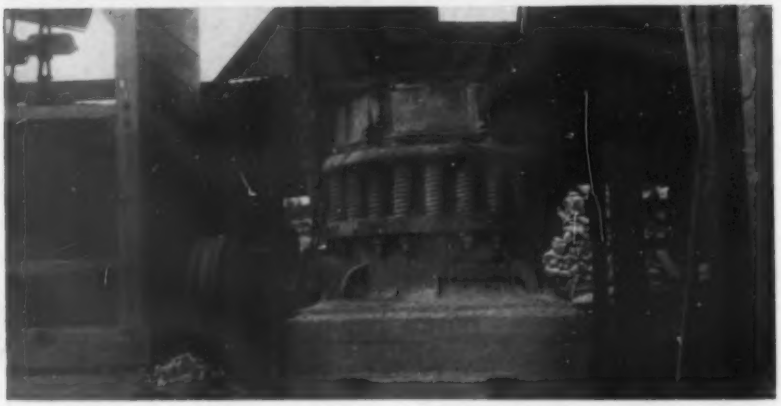
Extensive use is made of welding. In the background is the repair shop and one of the gasoline locomotives

Two quarries and three crushing plants are operated, the No. 1 quarry at Stolle, Ill., near East St. Louis on the Illinois Central Railroad, having two crushing plants, and the No. 2 quarry at Falling Springs on the Terminal Railroad, a few miles away, with one crushing plant.

The No. 1 quarry at Stolle has a depth of over 100 ft. on one level, and is approximately 1800 ft. long. The two crushing plants at this quarry are 500 ft. apart, and are almost identical as to capacity and arrangement of equipment so that they may be operated independently or simultaneously to meet any demand. However, at the No. 8 crushing plant, a No. 3 Symons cone crusher has been installed to operate independently or in conjunction with the main plant operations. (The No. 8 refers to the size of the primary crusher.) Generally it will be operated independently to produce 1-in. and minus or 1-in., ⅞-in., or ⅜-in. and dust from any surplus storage material accumulated during the rush season.

This operation requires only two men and a 35-hp. Fairbanks, Morse

Below: Looking down into No. 1 quarry. The two crushing plants and office building are shown to the right



Above: One of the crushing plants with stockpiles and loader in the foreground. Below: Cone crusher which operates independently or in conjunction with the crushing plant to produce sizes 1-in. down to dust from surplus storage

440-volt a.-c. motor producing 300 tons per day of sizes that generally move during slack seasons. The Symons crusher is generally fed a stone having a top size of 2½ in., which is dumped in a hopper by truck and carried by a Link-Belt bucket elevator, 30 ft. centers, to a chute, dropping the material into the crusher. The product of the crusher is elevated to two Tyler Hum-mer screens in tandem. Top screen has 7/16-in. sq. openings. Material passing this screen goes to the second Hum-mer with ⅛-in. slotted openings.

In regular operation, stone in cars from the quarry is drawn up an incline by hoist and dumped into a No. 8-D Allis-Chalmers gyratory crusher. The product of the crusher is carried to two rotary screens by a bucket elevator, 90 ft. centers. One screen is 46-in. x 20-ft. and the other is 38-in. x 20 ft. Both are three-section screens, having approximately 10 ft. of 1-in. screen mesh; 6 ft. of 1¾-in. mesh; and 4 ft. of 2¼-in. mesh, all round openings, the finished sizes dropping into bins. Of these sizes, 1¾-in. goes for Class X highway stone for bridges, etc., and 2¼-in. in Class A for paving. Materials are blended for various specifications by recombining different sizes in a bin.

Oversize from both rotary screens is returned to a surge bin by chutes, and from this bin it is fed into No. 5 and No. 6 Allis-Chalmers gyratory crushers. Material from these crushers is fed onto a belt conveyor which carries it to the bucket elevator serving the primary crusher to be returned to the rotary screens. Fines from ⅞-in. down are carried to the Hum-mer screens, previously mentioned, which take out ⅜-in. to dust products which are chuted to bins.

Crushing plant No. 8 has a bin storage capacity of 30 carloads, and the equipment is driven by individual motors. In recent years a number of short center V-belt drives have been installed on various equipment.

The No. 6 crushing plant has a No. 8-K Allis-Chalmers gyratory crusher, but the reduction crusher is a No. 6-D Allis-Chalmers unit. Two 42-in. x 18-ft. rotary screens are used. Fines are separated by a Universal vibrating screen. Storage bin capacity is about 12 carloads.

One of the more recent improvements at the No. 6 crushing plant was the removal of a steel spout carrying oversizes from the screens to the reduction crusher, and the installation of a conveyor belt in its place. The conveyor belt unloads into a surge bin alongside of the reduction crusher. This change increased the capacity of the plant about 30 percent, as it assures regularity of feed and no shutdowns due to steel spout getting blocked.

Handle Storage of Surplus With Trucks

Surplus storage of finished products for both crushing plants at the No. 1 quarry, Stolle, Ill., is now handled with trucks. Formerly, a 5-ton automatic side dump steel car was run over a 900-ft. trestle, 30 ft. high, by a double drum hoist engine with a railroad track on either side of the 30,000-ton storage for reclaiming with a steam shovel. Dumping by trucks also has reduced segregation.

A dumping platform was erected parallel with the railroad for loading the railroad cars with trucks. Trucks are first loaded from stock piles with a Barber-Greene loader, and then are dumped into railroad cars from the platform, two trucks loading a car in about 30 minutes. This is more economical and faster than getting up steam on the shovel for a few hours' loading.

Drilling at No. 1 quarry is done with Sanderson cyclone No. 14 electrically-driven well drills, and secondary drilling is by means of Ingersoll-Rand jackhammers. The stone is loaded by a Bucyrus 50-B electric shovel, and a type B Erie steam shovel. Three Whitcomb 8-ton gasoline locomotives on 36-in. gauge track haul the quarry cars to the inclines leading to the respective crushing plants.

At Falling Springs quarry No. 2 there is an almost inexhaustible supply of stone in a tract of 250 acres with a bluff front of two miles from 150 to 225 ft. high. The primary crusher at the quarry floor level is an Allis-Chalmers 7½ gyratory and the oversize after passing the sizing screens is fed to a 3 ft. Symons Cone reduction crusher. All rotary screens were taken out of this crushing plant and replaced by Niagara vibrating screens. The gasoline engine and side dump cars were replaced by a truck which is loaded with a steam shovel having a ⅞-cu. yd. dipper. Plant layout is about the same as at Stolle, Ill., with the exception of the changes mentioned. Truck scales are located at both quarries, and recently a concrete deck was placed on one to cut down on maintenance.

Repair Shop and Maintenance Practices

A permanent brick building at Stolle, Ill., houses the blacksmith and machine shop which is well-equipped with tools and welding equipment, both electric and oxy-acetylene. The electric arc welder is used to build up frog points and crusher mandrels and also to make emergency repairs.

Worn frog points to be built up are

thoroughly cleaned with a wire brush, and then a nickel-manganese steel rod is applied with the arc. In building up mandrels of the secondary crushers, a Stoody self-hardening rod was applied longitudinally with the mandrel axis using an electric arc. The rod first was applied to one side of the mandrel until the casting got pretty warm. It was then applied to another spot to allow the first spot time to cool off. Skip welding in this fashion did not permit the mandrel to become so hot as to change the structure of the casting. A similar welding job was done in a primary crusher mandrel.

Another example of improved maintenance practice of this company is the way excessive wire rope maintenance was reduced on its electric shovel. This electric shovel when new was furnished with a 1⅛-in. plow steel, regular lay, 6 x 19 hoist rope with an independent wire rope center. Owing to the very small diameter of drum (only 18-in.), the rope would quickly fatigue and break in that section which runs on and off the drum as the dipper drops and lifts. This rope had to be replaced every 15 to 18 days, regardless of operator's carefulness. To secure greater flexibility, a preformed Lang-lay rope was selected with the result that the life of the rope was doubled, according to T. H. Hirsch, chief engineer and superintendent of the company, who is also in charge of the shop.

A drum half again larger in diameter would more than double the life of the rope, but the construction of this older type electric shovel is such that a larger drum cannot be used.

What Controls Prices

(Continued from page 28)

ment approaches that kind of an industry and gives wide publicity to its prosecution, this is bound to drive capital away from investment in that industry, lessen employment and finally increase cost of the product through lack of capital and equipment for necessary economic production. Then the consumer will lose the benefit that would come from more efficient production and product improvement.

"This condition is not true of the very large corporations who have built up large cash reserves. It does, however, handicap competition dependent on outside capital for immediate growth. Then, since necessary capital is not available to the smaller concern, we have a condition that acts to stifle competition and encourage monopoly—just the opposite effect from that which the government administrators hope for.

"I believe the whole approach by the present administration to this subject is wrong, uneconomic and unsound. In a highly competitive industry where the producers make standard commodities one small unit in a section often determines the price for the industry, and in too many cases that is determined through ignorance of cost and method of distribution. Certainly the only practical way a condition like that can be corrected is through competitive contacts from which comes better understanding of the elements that make a reasonable profit possible."

Lime In 1939

Latest Bureau of Mines statistics for 1939 show an increase in quick and hydrated lime sales of 27 percent over 1938 or 4,254,348 tons, the highest since 1929. Sales of quicklime, 2,936,295 tons, were 35 percent higher than in 1938, while hydrated lime sales showed a gain of 13 percent. Consumption of agricultural lime declined slightly from 1938. Sales of hydrated lime for this purpose, approximately 60 percent of the total, fell below those of 1938, while the quantity of agricultural quicklime consumed increased nearly one-fifth. Building lime sales during 1939 exceeded those of any year since 1930 and surpassed 1938 by 17 percent. Consumption of hydrated lime comprised more than two-thirds of the total for this purpose in 1939.

Sales of lime for chemical and industrial uses were considerably above those of 1938, exceeding the previous high of 1937 by 68,510 tons. This increase was mainly due to an increase in metallurgical (including flotation) and water-purification processes.

Refractory lime sales increased sharply due to the stepping up of steel production.

Below: Close-up of electric shovel loading quarry cars and two well drills operating in the background

New Flux Stone Plant Makes 300 Tons per Hour

Diesel trucks and automatic scales speed up haulage from quarry to primary crusher

WHEN DEVELOPMENT WORK in its new limestone quarry is completed, the modern flux stone plant illustrated, herewith, will have a production of 300 tons per hour. (As the policy of the parent steel company is against publicizing the name of any of its component companies, the identity of this Pennsylvania quarry property cannot be revealed.)

Much of the equipment in the new crushing and screening plant was removed from the old location, which had been depleted of stone. Of all-steel construction, the new plant is of improved design and more economical to operate.

Screening and Crushing

Screening and crushing are simple operations since all the output is flux stone and there are no by-products, but some of the principles of design and operation which have reduced costs, are worth special mention.

The plant consists of a primary crusher at the foot of an inclined belt conveyor, with sizing screens and a secondary crusher superimposed on steel bins which load directly into railroad cars.

Steps in the production of flux stone. Fig. 1: Three wagon drills in action. Fig. 2: Driver weighing stone on recording, automatic scale. Fig. 3: Quarry truck dumping into primary crusher. Fig. 4: Grizzly to by-pass small stone around primary crusher

Quarry cars and locomotives were scrapped in favor of truck haulage, and the quarry eventually will be developed to two miles in length with roadways built and maintained for economical operation of heavy trucks.

Diesel-powered Trucks For Quarry Haulage

Five Euclid "Trac-Trucks," powered by 150-hp. Cummins Diesel engines, are the present means of transportation—two hauling stone a distance of one-quarter mile round-trip to the primary crusher and two handling the overburden. Pay-loads as high as 15 and 16 tons of stone per trip are hauled.

Trucks, which are end-dump, operate for eight hours on a fuel consumption of 20 to 25 gal. each. Roadways have an average grade of two percent. They were built with screenings and are maintained by the use of a Caterpillar Diesel tractor and LaPlant-Choate bulldozer.

The overburden varies from nothing up to 20 ft. in depth, and is excavated by a new 2½-cu. yd. Marion 392 Diesel-powered shovel. A 4-cu. yd. Caterpillar-mounted 103C Bucyrus-Erie steam shovel excavates the stone which occurs in a ledge 21 to 24 ft. in thickness. Primary drilling is done by three pneumatically-driven Ingersoll-Rand wagon drills which sink drill holes having 1⅝-in. finished diameter and spaced at 6 to 7 ft. apart.

Before dumping stone into the primary crusher, the driver makes a momentary stop to weigh his load. The scales are equipped with a Toledo "Printweigh" that by a push of a button records the weight and truck number for each load. It is a means of checking on inventory and pro-

Fig. 5: Three types of Diesel-powered equipment for efficient quarry operation. To the right, shovel dumping stripping material into large capacity truck, and to the left may be seen the tractor used in maintaining quarry roads and cleaning up

Automatic recording scales to weigh flux stone

vides an accurate basis for payment of royalties on quarried stone.

At the primary crusher, a No. 21 Allis-Chalmers gyratory, provision is made to by-pass stone up to 4-in. size. All the output of the plant is a 1½- to 5-in. flux stone. Trucks dump over a heavy steel bar grizzley ahead of the primary crusher through which the smaller stone passes on to a 12-ft. Stephens-Adamson pan conveyor which places it on the same belt conveying crushed material to the screening plant.

A heavy superstructure of I-beam and H-beam construction was built over the crusher and equipped with a 35-ton electric hoist for handling heavy crusher parts.

Several advantages are gained in by-passing the primary crusher. The grizzley has a moderate slope which practically eliminates all the shock of big stone hitting the crusher head. The production of screenings, minus 1½ in. in this plant, is likely held down in by-passing the crusher, and the load on the crusher is reduced. A 42-in. Stephens-Adamson belt conveyor, 360-ft. centers, delivers stone to the screens at the top of the main plant.

Crushers Located High in Plant

At the head pulley, the stone stream is split equally into two 5- x 21-ft. Allis-Chalmers revolving screens which have 4- to 5-in. sq. openings and outer jackets to remove screenings. Flux stone (1½- to 5-in.) and screenings (minus 1½-in.) are put into separate bins, with the oversize passing through a No. 5 Allis-Chalmers gyratory reduction crusher mounted just at the ends of the screens.

This crusher, by being installed in the upper plant structure, has eliminated the need for an elevator that was part of the old plant layout. It discharges into one of the flux stone bins over a dust plate which has 3- x ½-in. slotted openings through which the dust falls on a 20-in. belt conveyor which discharges into the screenings bin. Screenings are removed from the bin through a chute into a Koehring Dumptor which is used exclusively for stockpiling. Actual connected electrical power for the plant is 335 hp. A 175-hp. motor drives the primary crusher; 10-hp. the feeder, 75-hp. the belt conveyor, 25-hp. the secondary crusher, and 25-hp. motors are connected to each of the revolving screens.

Storage for flux stone and screenings consists of two hopper-bottomed bins set directly over railroad tracks of the New York Central railroad for direct loading into cars. Storage capacity isn't very great and serves merely as a surge, since loading out is done simultaneously with production.

Each bin is about the length of a standard railroad car and has two pneumatically operated bin gates which are operated by push button on the ground level. Cars are brought down by gravity and braked under the bins where a carload of 77 tons of stone is filled in two or three minutes. Cars are weighed under the bins on a 60-ft. Fairbanks railroad scale. This modern flux stone plant was designed by the superintendent.

Plant views and storage facilities. Fig. 6: Primary crusher in foreground with steel superstructure above to facilitate handling parts with plant shown in background. Fig. 7: Special dump truck hauls screenings away for stock piling. Fig. 8: Stockpiling screenings. Fig. 9: Close-up of pneumatic bin gate

Fig. 10: Spotting a freight car beneath bins. Car moves downgrade by gravity and braked under pneumatic bin gate

Forced Draft Lime Kilns

New system is particularly adaptable to short kilns where something simple is desired to eliminate hand-firing

By VICTOR J. AZBE

VERY RECENTLY a new system* of lime kiln operation was started successfully — a system that may be called "Forced Draft Operation of Lime Kilns." To accomplish this, the patented center burner was greatly elaborated and arranged so that not only is the combustible received through it by the kiln, but also both primary and secondary air for combustion.

Every unit of gas above receives its proper unit of air below; thus not only gas but also air are equitably distributed which is quite necessary for best results. The center burner becomes a unitized structure with many advantages.

For example, natural draft kilns operate without the aid of fans which are essential to mechanical draft kilns. Blowing air with fans or steam injectors into the ash pit of the furnaces, however, does not make them mechanical draft kilns, as that only overcomes the resistance of the fuel bed and none or but little of the resistance of the kiln charge.

Three Draft Systems— Advantages and Disadvantages

Mechanical draft can take three forms: "Induced Draft" which is commonly employed on lime kilns, "Forced Draft" often used on mixed feed kilns but heretofore never on gas fired kilns, and "Balanced Draft" which is a combination of the two. The first draws, the second pushes, the third is sort of push-pull, with the effect coming into balance in the hot zone, where uniform flow distribution is most important.

In all three cases fans are utilized. In the case of "Induced Draft" a rather large fan draws the hot gases from the kiln. With "Forced Draft" a fan or blower, supplies cold air to the distributing manifold in the cooler, from which point it enters the hot zone under slight pressure and there meets the combustible stream entering under a slightly higher pressure. In the case of "Balanced Draft" two fans, of course, are involved.

With a "Natural Draft," kiln capacity for a unit of size will naturally be the least. With mechanical draft, kiln output will be anywhere up to four times as great. Of the three systems the least capacity increase will be with forced draft, but at the same time this system is the simplest and most fool-proof. While it is common on mixed feed kilns it never was used on natural gas kilns, but now it is possible through the provisions of the latest center burner designs, and poke hole arrangements.

LIME FORUM

Mr. Azbe is a contributing and consulting editor of ROCK PRODUCTS. He will be glad to receive inquiries from his readers, and will answer these direct or through the columns of this Forum.

Kilns of 12-ft. shell can be lined to give a 50-ft. shaft and to produce 25 tons of lime by this system. For this amount of lime, the kilns need not be so high. With induced draft much larger capacities are obtained but kilns must be considerably higher. Balanced draft systems, the latest development, are somewhat complicated and are to be used on kilns of most modern type only, where they help to justify the investment.

Even "Induced Draft" operation is complicated. The draft is not always uniform; when gas temperatures are high it is much less than when cool, say after charging of stone. At times the gases are so hot that fan operating difficulties develop. Frequently when very hot, draft is so poor that the injected combustible does not receive sufficient air for combustion and later catches fire in the kiln top when leakage air from the charging door supplies the required oxygen. When that happens, fans heat up rapidly.

Another objection to the "Induced" system of operation is stratification. Air coming up the cooler runs to "loose" places and travels up the kiln, not uniformly divided over the entire cross-section, but along preferential channels. When into such channels ample gas is injected high temperatures occur and lime is made rapidly and high up into the kiln, all to the disadvantage of the adjacent sections. If, on the other hand, the combustible does not find access into such loose places, then temperatures are low due to too great a quantity of air passing, while frequently a section of the kiln is cool due to too much combustible, but far more often it is cool due to too much air caused by improper distribution in the first place and loose kiln suctions in the second.

Easy to Control Temperature With Forced Draft

When air is "forced" rather than "induced" this stratification is much less and when, at the same time, it is properly distributed to begin with, and not allowed to stratify before reaching the combustible, the desirable state occurs when the hot zone has a uniform distribution of heat and not a mixture of hot and cool zones.

Forced draft can not be applied to hand fired kilns. It would be possible if the fire door could be made tight to hold the pressure, but no fire door of the large dimension necessary for hand firing could remain tight enough for long under the exposure to the high heat of direct fired furnaces. However, when the fuel is gas, either natural gas or producer gas, or even gas from individual producers, then the system can be made to serve its purpose nicely. It lends itself particularly to small kilns and with such would greatly simplify operations, raise capacity, and reduce labor and fuel.

Forced draft as practised lends itself also very well to temperature control. Kilns are arranged for primary air admission and equitable distribution. All sensible heat in the lime is recovered and the lime is drawn cold. Preheated air enters the hot zone and there, with the combustible, creates high temperatures. But by means of the secondary duct either excess air or spent kiln gases can be supplied to the hot zone and thus temperature

(Continued on page 42)

* U. S. Patent No. 2,199,384 by Victor J. Azbe.

The House of Gypsum

Largest Swiss gypsum manufacturer has developed several products having new applications in building construction

By F. O. ANDEREGG, Ph.D.*

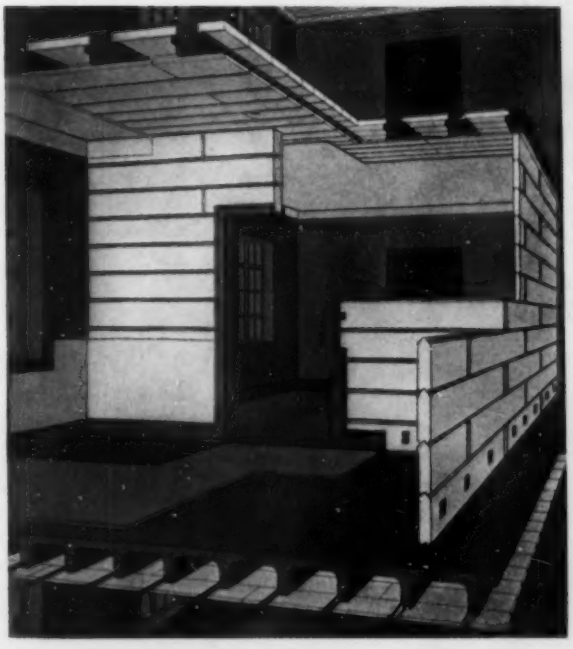


Fig. 1: Cut-away view of interior showing application of gypsum tile and plank

IN SWITZERLAND one of the largest manufacturers of gypsum products developed so many uses for its products that it may be truly said the "House of Gypsum" has arrived. In addition to the usual plasters and Keene cement, Gips-Union, Zurich, produces a hydraulic cement, recommended as a base for linoleum, an extra hard plaster to resist rough treatment, a rapid setting white cement, acoustical plaster, a stone-patching cement, and a general purpose patching plaster, suitable for patching floors under linoleum and stair treads. Dental molding plasters are also prepared.

Of particular interest to American companies are the systems of precast products for flooring, walls, and suspended ceilings. Fig. 1 illustrates several of these products. Starting at the bottom, the white slabs of a gypsum ceiling, suspended from a concrete floor, may be seen. On top of the concrete is a layer of thin special hydraulic cement, serving as a linoleum base. Partitions are erected using tongued and grooved tile or plank. These may be plastered or the joints can be accentuated by beveling in one or two directions. Above, a ceiling of gypsum slabs is nailed to wooden joists, with other slabs serving as sub-floor. As lining for the outside wall, large, thin panels may be employed. Unit weights vary from 25 to 100 percent.

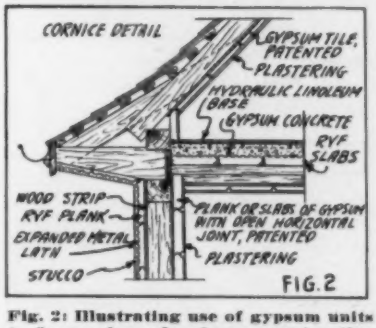


Fig. 2: Illustrating use of gypsum units to fireproof wooden frame construction

Some of the means used in fireproofing wooden frame constructions are demonstrated in Fig. 2, with gypsum slabs applied to the underside of roofing, as a base for concrete floor topping, as suspended or nailed ceiling, and as inside and outside wall sheathing. A layer of plaster is shown as applied to the inner sides of all units. The proposal of outside sheathing, according to Ryf, is an interesting one. The planks have tongued joints to improve the strength. The outer face is grooved to provide a mechanical key, and when it is covered with metal lath it may be stuccoed with weather resisting materials. The slabs are nailed to the frame and may readily be sawed to dimensions.

Precast gypsum units are convenient for designing fireproof floor systems, in one of which eye beams are used as pictured in Fig. 3. The bonded excelsior Perfecta slabs are slipped over the lower flange of the eye beam, which are on 40 in. centers. After placing the reinforcement, a concrete topping is applied. In this way a very light floor is formed, having an ultimate strength of about 164 p.s.f. The slabs are about 20- x 40-in., and vary in weight from 50 to 65 lb. This construction can be carried out without forms.

The nature of the material used in these particular slabs is illustrated in Fig. 4, where the properties are also listed. The claim is made that these

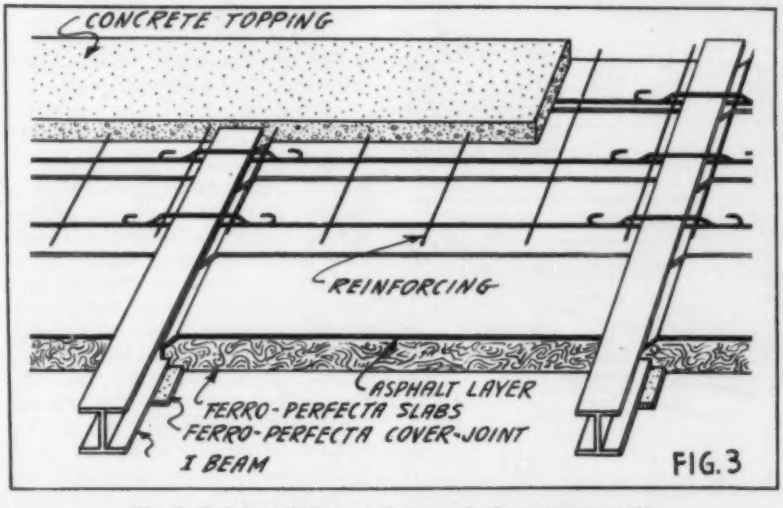


Fig. 3: Reinforced floor system employing gypsum units

*Consulting Specialist on Building Materials, Newark, Ohio.

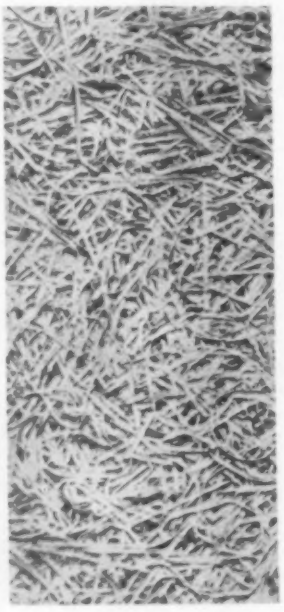


Fig. 4: Light-weight Perfecta panel of gypsum showing texture of face

units will withstand repeated freezing and thawing, even when immersed in water. In plastering the Perfecta surfaces, they are first painted with neat plaster. When the exterior is to be stuccoed, the surface should first be painted with neat cement slurry.

Another form of flooring, requiring a small amount of temporary supporting framework, is shown in Fig. 5.

This concern is also merchandising a suspended ceiling patented by Moriggia, as shown in Fig. 6. A variety of galvanized ties may be used, according to the particular application. This type of ceiling is claimed to be free from cracking and to have excellent sound deadening.

Eliminate Cracking By Suspending Ceiling

Gips-Union has apparently gone as far as anybody in making available a wide range of precast gypsum units, in addition to numerous brands of standard and special plasters for job application. The ease with which dimensions can be varied, in combination with the light-weight, fire resistance, the acoustical properties, and the ease of application make gypsum units attractive for merchandising.

The Swiss claim to be able to make several of their products resistant to wetting and to freezing when wet. Whether the proposal to apply, say a portland cement stucco on the outside of gypsum slabs, can be satisfactorily carried out under the weather conditions prevailing in the northern part of our country is an open question.

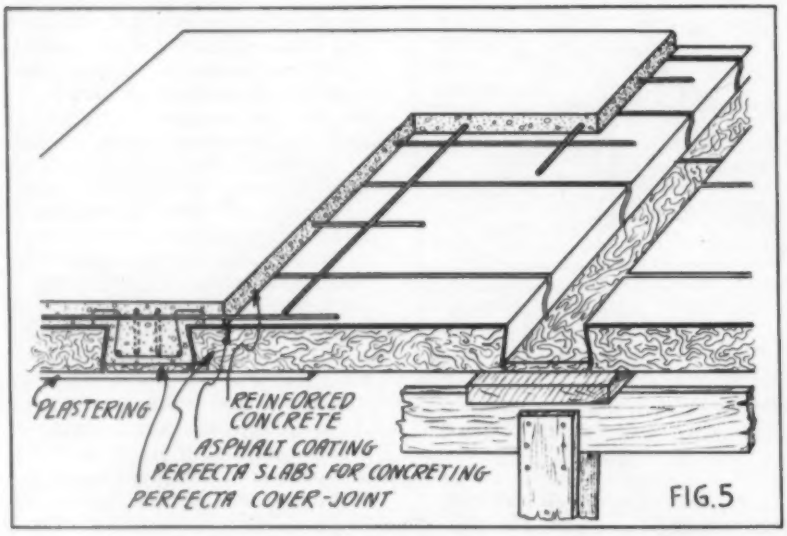


Fig. 5: Gypsum slab flooring with reinforced concrete which requires a small amount of temporary supporting framework

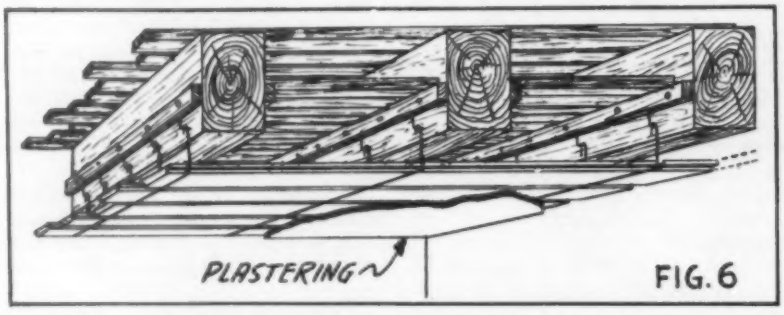


Fig. 6: Suspended ceiling construction of patented design, showing suspension

Highway Board Report Gives Valuable Information

NEARLY 600 pages of interesting reports have been published in the bound volume containing the proceedings of the 1939 Highway Research Board annual meeting.

Of particular interest to ROCK PRODUCTS readers is the paper, "Studies of Subgrade Pressures Under Flexible Road Surfaces," by A. T. Goldbeck, engineering director, National Crushed Stone Association. These studies show the results of pressure measurements taken under 4-in., 6-in., and 8-in. of stone screenings placed on a subgrade and subjected to 4000, 8000, and 12,000-lb. wheel loads. A paper by B. E. Gray, chief engineer Asphalt Institute, under the title "Present Design Practice and Construction Developments in Flexible Pavements," deals with bituminous pavements, stressing the importance of the subgrade and mentioning the growing use of stone screenings as an insulation layer between subgrade and pavement proper. Another paper by Mr. Goldbeck entitled, "Durability Investigations," questions the value of freezing and thawing tests as now applied to measure durability of aggregates or concrete. "Progress in Soil-Cement Construction," presented the findings of six state highway departments.

The highway report is well-illustrated and was edited by Roy Crum, director of the highway board.

Develop Gypsum Property

TEXAS GYPSUM MINING & CONSTRUCTION CO., Hempstead, Waller County, Texas, has plans to develop gypsum mining properties near here where 7500 acres have been leased. D. S. Culberson is in charge. The company will sink two shafts for initial production, and will install electrically-operated mining machinery, draglines, shovels, conveyors, etc. The plant will cost $100,000. The 1000-ton per day output of crude gypsum will be used for production of wall board under a new process, and a mill and other structures will be built later. Charles A. Howe is president.

Sampling Devices For Processing Portland Cement

Scientific and accurate sampling is essential to success in proportioning for the newer specification cement

By NATHAN C. ROCKWOOD and BROR NORDBERG

REFERENCE was made in the article on "Sampling Cement Materials," in the August, 1940, issue of ROCK PRODUCTS, pp. 47-51, to a device well-known in the mining industry for sampling ores. Three cement companies are already using this device for sampling raw materials or cement: the Universal Atlas Cement Co., Leeds, Ala., on slurry; the Permanente Corp, San José, Calif., for both slurry and cement; the Three Forks Portland Cement Co., Trident, Mont., on dry raw materials.

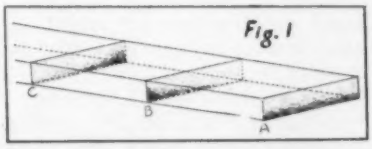


Fig. 1: How a stream of material may vary in different parts of its cross-section. A, B and C represent how the stream may vary at different stages of flow

The device is known as the Geary-Jennings sampler, made by the Galigher Co., Salt Lake City, Utah. Made in four different variations, as illustrated herewith, it is designed for both slurry, dry raw materials or cement sampling. It is admitted that ore sampling by scientific methods is probably more important than cement raw material sampling because changes in the ore stream may occur rapidly, while in a well regulated cement plant changes should not be large or rapid. Nevertheless scientific and accurate sampling in a cement plant may be essential to success in proportioning and processing for the newer specification cements.

The illustration, Fig. 1, from the Galigher Co.'s literature shows how a stream or ribbon of material may vary in different parts of its cross-section. All cement plant chemists have learned this by experience and it accounts for some unsatisfactory methods of or devices for sampling. Samples taken at *A*, *B* and *C* would likely prove different, and a sample of the upper part of the stream would be different from the lower half. The first essential of a representative sample is therefore to obtain a cut across the entire stream; the second essential is to get equal percentages from all parts of the stream; third, to have the interval between cuts constant, otherwise all sections along the length of the stream will not be equally represented; fourth, cuts made frequently enough to insure changes will be caught.

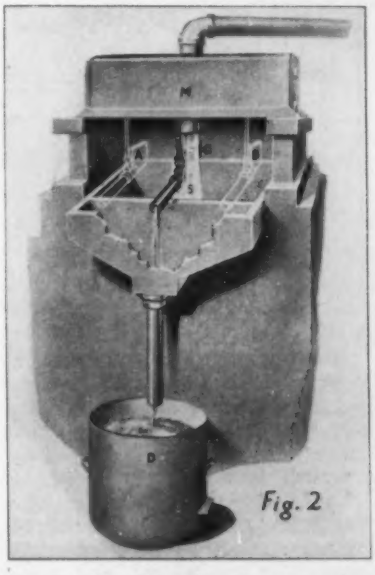


Fig. 2: The Geary-Jennings sampler, designed for use on slurry, dry raw material or cement

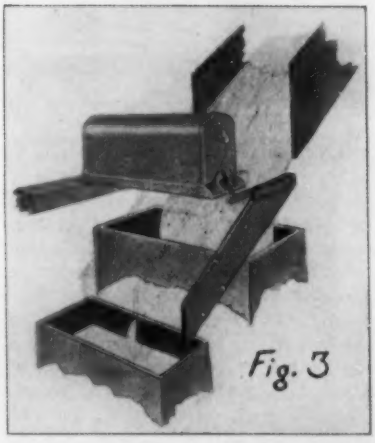


Fig. 3: The Geary-Jennings sampler modified for sampling dry materials

The Geary-Jennings sampler is a mechanical device, illustrated in Figs. 2, 3, 4 and 5, which moves a slotted receiver (the cutter) across the stream of material at regular intervals, deflecting the sample to a bucket or other container for the sample. For dry materials (Fig. 3) the cutter is a slotted vane. The driving mechanism is a reversible electric motor, controlled by a time switch, and a threaded shaft on which the cutter carriage rides. The stock sampler travels at a speed of 5.7 in. per second, but any speed desired can be supplied. The width of travel is from 15 to 60 in., or more, if desired. Cutters are made in different types for different applications. For wet materials such as slurry the slot opening is normally 3/16 in.; for dry materials cutters like that shown in Fig. 3 are made with slots having as wide as 6-in. opening, for large size aggregates. Such an installation, for sampling raw material or clinker on a belt conveyor is shown in Fig. 4.

A German device for sampling a stream on a belt conveyor is illustrated in Fig. 6, which is taken from

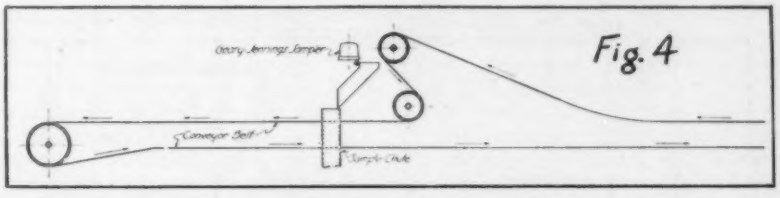


Fig. 4: Installation for sampling raw material or clinker on a belt conveyor

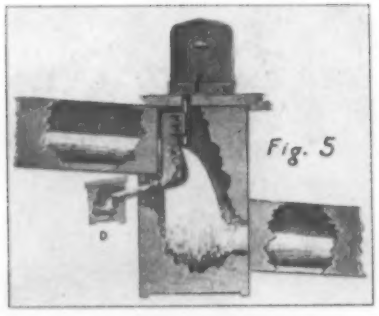
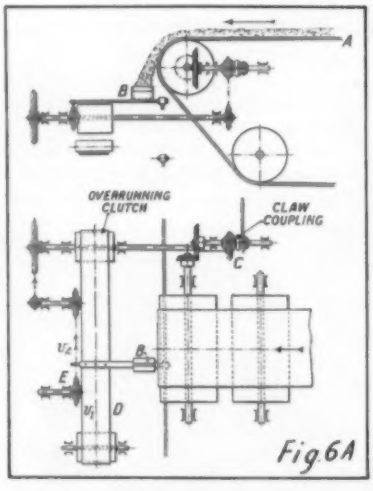


Fig. 5: How the Geary-Jennings sampler operates with wet materials

Mine and Quarry Engineering (British) July, 1940, p. 207. The stream of material is being delivered by a belt conveyor *A*. Samples are taken by the specially shaped cup *B* three times during each complete revolution of the belt *A*, the movement of *B* across the stream of delivered salt being at a speed v_2 predetermined by hand-sampling as giving correct results. The apparatus is driven by bevel gearing and a claw coupling from the conveyor head-drum spindle, the cross belt *D*, to which *B* is attached, being thus driven at speed v_1. At the same time the chain *F* is driven at speed v_2 and the arm carrying *B* is provided with a projection *E* which engages with *F*. The cup *B* is thus moved at speed v_2 during the sampling operations, this being made possible by a free-wheeling clutch in the driving pulley of *D*. During its return travel *B* empties the sample into a trough.

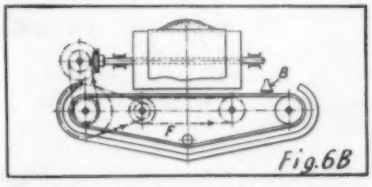
Take Sample in Vertical Part of Pipe Line

The Fuller Co., Catasauqua, Penn., recently acquired the patent rights for a mechanical sampling device developed by Louis Anderson, chief chemist of the Alpha Portland Cement Co. This sampler is illustrated in Figs. 7 and 8 as applied to a Fuller-Kinyon transport line and as applied to a screw conveyor. It is for dry materials. The drawings are self-explanatory—a small screw conveyor operating in a slotted pipe which picks up and removes a sample from the entire cross-section of the conveyor pipe, or chute. It is designed to take a small sample continuously, but of course could be designed to operate only at regular intervals.



The important thing in taking samples from pneumatic conveyor systems in connection with Fuller-Kinyon pumps is to install the sampler in vertical parts of the pipe line. Chemists who have had experience with this type of sampler in horizontal pipe lines have found that the coarser material in the line tends to drag along the bottom, and representative samples can not thus be obtained. In a screw conveyor, with the material constantly being turned over, apparently this difficulty is not met with.

There are numerous homemade devices for sampling material in screw conveyors, the simplest and commonest being merely a spoon attached to the conveyor shaft, which picks up a sample with each revolution of the screw and throws out the sample through a slot in the conveyor housing on the down stroke. Apparently these give fairly satisfactory service.



Figs. 6A and 6B: Device for sampling a stream on a belt conveyor. Fig. 6B shows end view

At one Western cement plant where shale and limestone are mixed dry, after passing through rock crushers, samples are taken by home made rotating scoop devices at three points in the flow sheet. The first sampler can take as much as one-tenth of the flow, which is diverted to a mixing drum and a part of the original one-tenth through a second sampler to a small hammer mill, after which there is another mixing drum discharging through a third sampler for the laboratory. This three-sampler system constitutes a kind of pilot plant for control of the entire mill stream.

The next article will describe sampling devices used in Lehigh Valley plants, as required by New York State public works specifications.

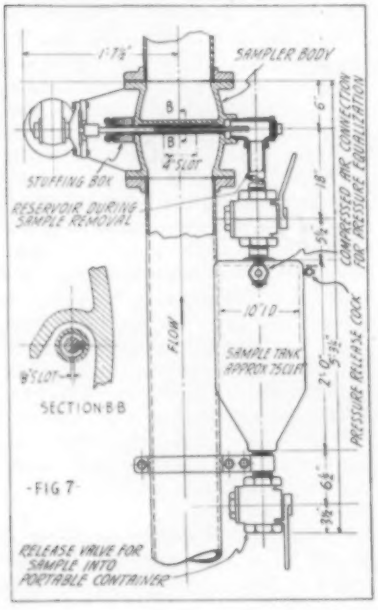
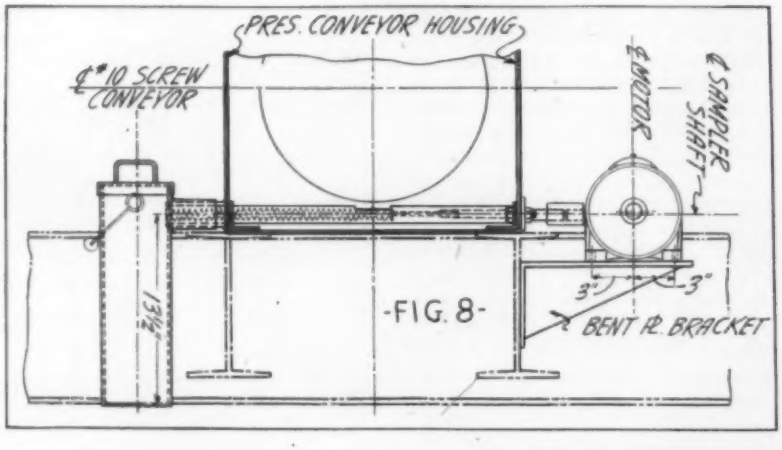


Fig. 7: Sampler operating on vertical part of pipe line by means of a small screw conveyor operating in a slotted pipe

Fig. 8: The same type sampler shown in Fig. 7 applied to a 10-in. screw conveyor



Calculations for Apparatus Using Rising Currents

Article 17 describes elementary factors in the design of rising current sand classifiers

By EDMUND SHAW

IN ARTICLE 13 of this series (May, 1940, p. 49) the calculations necessary to design a plain surface current settling box were given. In this part the calculations to design rising current classifiers will be considered.

The first form to be figured will be a simple sand cone. The same method applies to figuring the settling basin area of a drag or rake classifier, but the cone is chosen because the form is simpler and no allowances have to be made for moving parts. After this form has been figured a more complicated form employing two rising currents, one from the feed water and one from the hydraulic water employed, will be considered.

The sand cone is shown in section in Fig. 1. The feed of sand and water comes down the launder and falls through the feed pipe into the body of the cone. There the coarse sand settles out and forms a basin, shown by the dotted lines, while the water, carrying the fine sand and clay, overflows. It is in the sand basin that the classifying, the separation of fines from coarse, takes place. The rising current, as shown by the arrows, is vertical in the center and almost horizontal at the overflow lip, but experiment has shown that it separates the fine from the coarse as it would if it were vertical.

The ring around the feed pipe is only to prevent air bubbles brought in with the feed from disturbing the water in the sand basin too much, but its size must be taken into account in the calculation.

Finding the Area for the Required Upward Velocity

What we want to find is such an area that the water rising through it will have the velocity sufficient to carry over particles of the size not wanted in the settled sand. And this area will be that of the top of the cone where the water overflows.

We will assume that the cone is to handle 50 tons per hour, that 300 tons of water will accompany the sand and that (in order to simplify the work) no account is to be taken of the fine sand and clay overflowing. We want to make a split on 65-mesh.

We are going to deal with a falling rate in inches and seconds so it will be convenient to convert all quantities and times to these units.

Calculating the Water Flow. The water is assumed to be 300 tons per hour. An easy way to get this into inches is to put it in gallons of 231 cu.

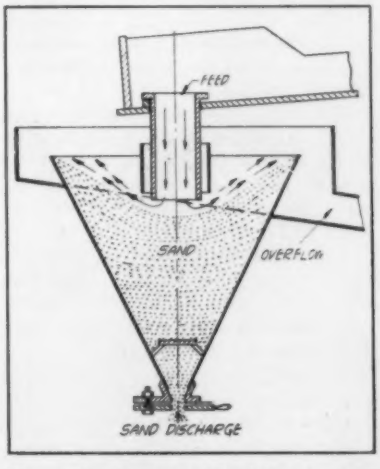


Fig. 1. Sand cone with rising current created by the feed water

in. We more often deal with gallons per minute than tons per hour anyway. Then as 1 ton = 240 gal. we have

$$\frac{300 \times 240}{60 \times 60} = 20 \text{ (gallons per second)}$$

$$20 \times 231 = 4620 \text{ (cu. in. per second)}$$

Calculating the Area. The current must have a rising velocity equal to the falling rate of a 65-mesh grain, if we are to split the sand on that grain size. And this velocity, as we have seen, is determined by the area at the overflow. Hence, if we divide 4620 by 1.37 (the falling rate of a 65-mesh grain from Prince's curve) we will have the area required.

$$4620 \div 1.37 = 3372 \text{ sq. in.}$$

But a part of the area at the top of the cone is not active, as it is taken up by the feed pipe and ring. We will assume the ring to be 16 in. in diameter, and as the area of a 16-in. circle is 201 sq. in. we will add 201 to the area already found. The full area then will be $3372 + 201 = 3573$ sq. in. This is a circle and the corresponding diameter is 67.5 in. The cone therefore must have a diameter of 5 ft. 7½ in. at the top.

Calculating the Discharge Opening. The opening in the bottom of the cone must be calculated to make sure it is large enough for all the sand to flow out. This is simple because experience has shown that such an orifice (usually spoken of as a "spigot") will discharge about 200 lb. per sq. in. of cross section in one minute. We have only to find the pounds per minute discharged and divide by 200 to get the area wanted.

Fifty tons per hour is $50 \times 2000 \div 60 = 1666 +$ lb. per minute. Dividing 1666 by 200 we have 8.33 sq. in. as the area required. This is a circle of about 3¼ in. in diameter, but it would be better to make it 3½ in., or even 4 in. to allow for overfeeding.

This figure of 200 lb. a minute holds good only for spigots of 2½-in. diameter and larger. It is very much less for smaller sizes owing to the greater friction developed by the flow. But spigots smaller than 2½ in. are not much used in rock products industries.

The spigot is shown here closed by a hand-regulated gate, a poor contrivance at best. Sand cones used commercially are fitted with automatic discharge arrangements, and these are to be preferred, as they lessen the attention needed. They will be described along with other commercial machines.

Fig. 1 shows that a circular plate or diaphragm is placed in the cone a short distance above the spigot. This does not affect the classification, but it helps to prevent the formation of a channel in the center of the cone and the rush of water and sand that would follow.

Classification with Hydraulic Water

Sand cones and similar separators are not very good classifiers on coarse meshes, according to the writer's ex-

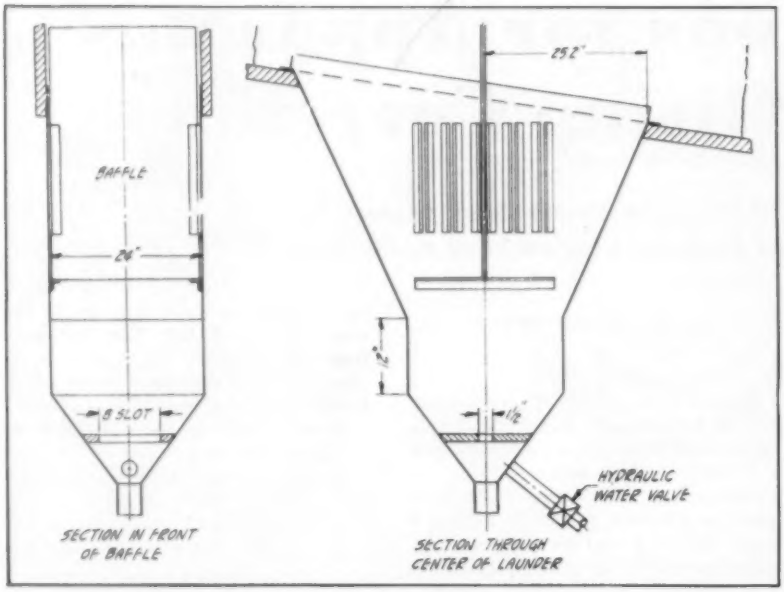


Fig. 13: A simple classifier using two rising currents

perience. For coarse grain separations it is necessary to use hydraulic water to keep fine grains out of the spigot.

In order to show a simple but workable classifier using hydraulic water, a launder pocket taking out grains from ¼-in. to 10-mesh has been chosen. It will be designed to handle 50 tons of sand and 300 tons of water per hour. A cross section and a longitudinal section are shown in Fig. 13.

It will be assumed that the pocket is to be placed in a launder 2 ft. wide. The rising current is made by a baffle so that the current flows down one side and up the other. We need then to calculate only one dimension, the distance from the baffle to the edge of the classifier, the other dimension for the space through which the rising current passes being the width of the launder. This dimension is given as 25.2 in. in the drawing, and the way it is obtained is as follows:

The water flow, as before, is 300 × 240 ÷ 60 × 60 = 20 gal. per sec., which is 4620 cu. in. In addition to this we have the hydraulic water to calculate. This water comes from the pipe shown below at the right and passes through a slot. The dimensions of the slot can be anything that will pass the grains comfortably, and in this case a slot 8-in. by 1½-in. has been assumed.

Since the quantity of water passing equals the area times the velocity we can figure it if we know the falling rate of the grain we wish to admit or just balance. This grain is 10-mesh and the falling rate is 8.5 in. per second. As before, we must correct the falling rate for the specific gravity 1.14), reducing it to 7.8 in. per sec.

The dimensions of the slot are 8 × 1½ in. or 12 sq. in., so the water passing will be 12 × 7.8 or 93.6 cu. in.

The total water then is 4620 + 93.6 cu. in. or 4713.6 cu. in. Dividing this by 7.8 we have 604.3 sq. in. as the area wanted, and since the pocket is 24 in. wide, the other dimension is 604.3 ÷ 24 or 25.2 in.

The baffle is a steel plate which slides in grooves made of channel iron. Other grooves are provided so that the baffle may be shifted to the right or to the left. Shifting it to the left throws finer grains to the overflow and shifting it to the right throws coarser grains into the overflow.

The hydraulic water must be regulated to correspond with the rising current in the pocket. If it is made too strong there will be an accumulation of grains in the pocket that will finally go out as a mass or form a bank and fall so as to choke the slot.

This type of classifier has been used to "rough off" a product which was afterwards dried and screened to make special sands. By discarding the greater part of the fines a product was left that cost much less to dry and that could be screened more easily.

(To be continued)

Forced Draft Kilns

(Continued from page 36)

effectively controlled, if that is desirable.

With "Forced Draft" the tops remain wide open and the stone can drop low as there is no danger of warping the tops or getting fans too hot. While it is desirable, of course, to keep the kilns full, that is not absolutely necessary and night charging —which is imperative with short induced draft kilns not having superimposed storage zones—is not necessary. Night charging when there are no stone storage kilns is a complication to be avoided if possible.

Control of these forced draft type kilns is simple. The air gate is adjusted to half inch pressure in the hot zone and the gas valve so that there is only a tiny trace of smoke coming off. Efficiency is high because combustion is perfect and is accomplished with less excess air and lower loss due to incomplete combustion than any other system, and the adjustment once established remains.

"Forced Draft" operation does not replace induced and balanced draft systems. They are necessary if the maximum is to be realized from the investment, and if the very cheapest lime is to be made. But "Forced Draft" is useful where something simple is needed in substitution for the very wasteful hand fired operations of today. It is particularly adaptable where the kilns are short as they are in certain Ohio and Wisconsin districts. It can be used on kilns with short coolers and at the same time cold lime obtained which may be sorted immediately, permitting a completely mechanical plant, the only type that will prove profitable in the future.

British Sand and Gravel Sizes

Now that we have begun recognizing three or more sizes of commercial sand in the United States for use as concrete aggregate, it may be we can name them. This would make the sizes more familiar and easier to sell, it would seem, than merely designating by sieve numbers. The British use the following terminology:

RANGE OF SIZE OF FRAGMENTS FOR SAND AND GRAVEL AND RELATED GRADES*

Cobbles	Between 200 mm. (8 in.)	and 50 mm. (2 in.)
Pebbles	Between 50 mm. (2 in.)	and 10 mm. (2/5 in.)
Gravel	Between 10 mm. (2/5 in.)	and 2 mm. (2/25 in.)
Very coarse sand	Between 2 mm. (2/25 in.)	and 1 mm. (1/25 in.)
Coarse sand	Between 1 mm. (1/25 in.)	and 0.5 mm. (1/50 in.)
Medium sand	Between 0.5 mm. (1/50 in.)	and 0.25 mm. (1/100 in.)
Fine sand	Between 0.25 mm. (1/100 in.)	and 0.10 mm. (1/250 in.)

*After Tyrrell.

Shipping Acceptable Products

ARTICLE EIGHTEEN

On sizing, testing and specifying aggregates gives suggestions on proportioning mixed sizes and on dust elimination

By ELWOOD T. NETTLETON*

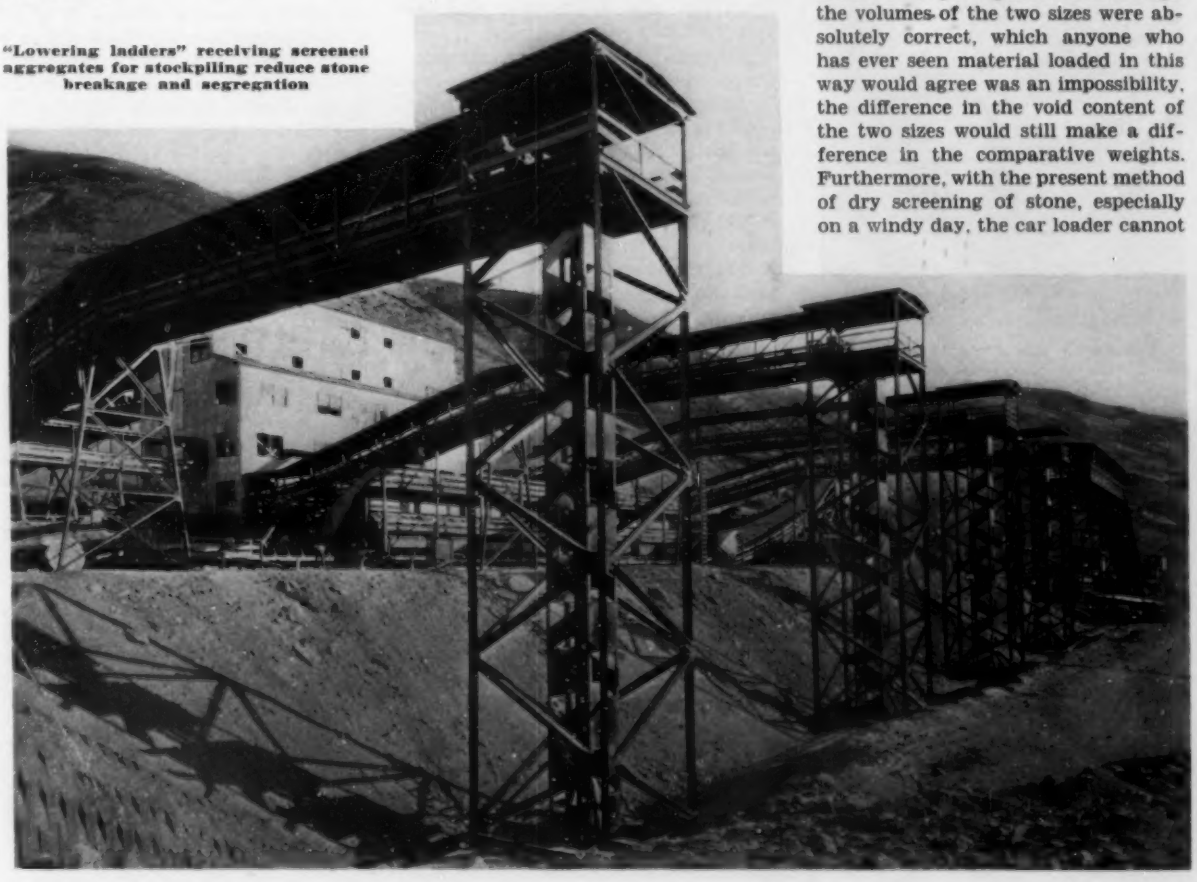
NO PUBLIC OFFICIAL, engineer, or customer has the prerogative of requiring any manufacturer or producer of aggregates to use certain equipment or methods in the processing of his material. The former does, however, have the authority to write the specifications. It so happens that sometimes combinations of certain sizes are desired, and required in order properly to meet these specifications.

How can a producer combine these sizes properly? If he knows the normal or average screen analysis of the various primary sizes, he can mathematically calculate the proper combination of primary sizes.

Suppose this calculation requires 55 percent of size A by weight, and 45 percent of size B by weight to give the desired mixture. How can the producer adjust his chutes so as to properly obtain this mixture in his bin? He can do so only by a trial method involving many grading-analysis tests of his product, and by continually cleaning out his bins between these tests until the right blocking of chutes provides, by trial and error, the desired mixture. The labor, expense, time and loss of material unsatisfactorily mixed should eliminate this haphazard method.

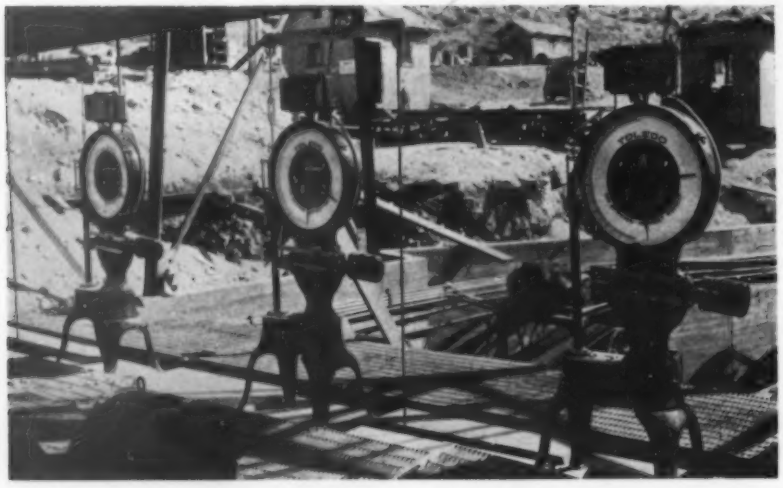
Blending on tunnel conveyor

Can a producer mix various sizes in the truck or railroad car by loading one size and then another? Usually the bottom of the railroad cars and often trucks are so irregular that visual loading in layers of apparently the required volume of primary sizes is at best a poor guess. Even though the volumes of the two sizes were absolutely correct, which anyone who has ever seen material loaded in this way would agree was an impossibility, the difference in the void content of the two sizes would still make a difference in the comparative weights. Furthermore, with the present method of dry screening of stone, especially on a windy day, the car loader cannot



"Lowering ladders" receiving screened aggregates for stockpiling reduce stone breakage and segregation

* General Superintendent, L. Suzio Construction Co., L. Suzio Trap Rock Co., The Suzio Trap Rock Co., and the York Hill Trap Rock Quarry Co., Meriden, Conn.



Accurate proportioning of aggregate sizes by means of a battery of scales

see accurately how much stone is going into the car, for clouds of stone dust fill the air under such conditions.

The only accurate and scientific approach is some method of weighing as the stone is loaded, or an accurate volumetric measuring device. When

Volumetric proportioning device

this system is used, a batcher measures the proportions of each material before it is loaded mixed into the truck or car. One operator controls the plant and loads all trucks or railroad cars. This weighing or volume batcher eliminates the expensive and troublesome platform truck or car scales. There is no freezing of scales, no pumping of water out of scale pits, and no damage to the weighing equipment due to impact of heavy trucks or railroad cars. It saves weighing of trucks before each loading. Weight often varies between loads due to changes in the amount of gasoline, air in the tires, and miscellaneous things thrown on the truck.

Other advantages derived from the use of a weighing batcher are that a customer obtains the exact weight he desires; truckers can carry the full capacity of their truck without the chance of overloading; there is less danger of scales getting out of balance; and there is more accuracy in weighing. When a combination of sizes is necessary, the producer can combine the various sizes accurately according to weights. Without such batching equipment this is impossible. Material drawn out and placed in stock can, also, be weighed and inventoried correctly.

Although it is not the common practice in the crushed stone industry to collect or eliminate the dust from crushing and screening operations, the problem has become so acute in certain local points that quarries have been forced to wash the stone or to collect the dust for the following reasons:

(1) Nuisance: When quarries are located close by dwellings, office buildings, factories, or even public highways, the continual clouds of dust, especially on windy days, are quite objectionable.

(2) Health: Medical authorities agree that the dust from most types of stone does not cause silicosis, although there are some types of rock which may cause silicosis by the presence of enough free silica.

Even though the dust from most stone is not a cause of silicosis, the dust is probably of no benefit to the average person's throat and lungs. With state and local labor and health boards making more rigid rules, and with the court's tendency to show partiality to the plaintiff, it is not unlikely that future laws will prohibit the free discharge of large amounts of dust into the air.

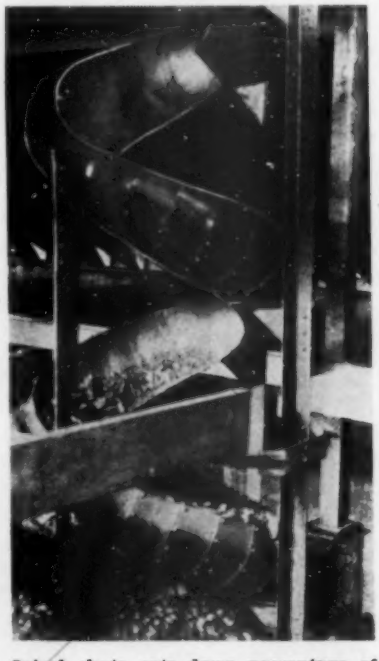
(3) Safety: Large amounts of dust in the air impair the employe's vision. Faulty vision is one of the greatest causes of accidents, particularly around machinery. It is often advantageous not to have crushing and screen houses fully enclosed. Rains wet the stone dust which covers the floors, railings and ladders. This wet stone dust becomes very plastic and slippery, providing extremely favorable conditions for bad accidents.

However, the cost of installing a wet process or some form of dust collection is not without compensation to the producer. By the elimination of a large amount of claims, either from accidents or industrial diseases, the producer may save on insurance.

By the elimination of this free dust in the air which gathers on the stone in the plant and bins, and which often concentrates in pockets, spoiling other clean stone, not only in the bins but in neighboring stock piles, the producer may avoid future claims for dirty stone.

Elimination of dust is often done by providing suction at the discharge point of the crushers and by collecting the dust in dust collectors. An atomized spray of water at the discharge end of the conveyor belt from the secondary crusher is also used. Only sufficient water should be used at this point barely to lay the dust, and not enough to affect the sizing on the fine meshed screens. It is not a good policy to place these atomizer sprays ahead of primary or secondary crushers because a crusher always shows greater efficiency when working on dry than on wet stone.

(To be continued)



Spiral chute cuts down percentage of broken stone

NATIONAL ASSOCIATION ACTIVITIES

Lime

COMMENTING on an item appearing in ROCK PRODUCTS about a cement company being elected to membership in the 1000-Day Club of the Portland Cement Association, the National Lime Association reports that three lime plants also have the distinction of having operated 1000 days without a lost-time accident. These plants are the Ash Grove Lime & Portland Cement Co., Galloway, Mo.; North American Cement Corp., Berkeley plant, Martinsburg, W. Va.; and Marblehead Lime Co., Springfield, Mo. The score is now four cement companies belonging to this select circle of safety record winners as against three lime companies. The Lime association is out to beat the record.

Research Fellowship

ANNOUNCEMENT has been made by Director of Engineering, Stanton Walker, National Sand and Gravel Association, that Fred F. Bartel, a 1940 graduate in Civil Engineering, University of Wisconsin, has been appointed to receive the association's Research Fellowship at the University of Maryland. Mr. Bartel will deal with the general problem of the "Effect of Aggregates on the Durability of Concrete," but his principal attention will be devoted to a consideration of gravels which are predominantly chert. Mr. Walker also reviewed the work recently carried out or now under way in the Research Foundation laboratory.

Sand and Gravel

EXECUTIVE SECRETARY V. P. AHEARN has warned the sand and gravel industry to safeguard its constitutional rights with respect to filling out Form AD-85 which some members have received from regional offices of the Wage and Hour Division. This form states that information has been received "indicating a probable violation by your firm" of the federal wage and hour law. The employer is instructed to furnish the information outlined on the form and to return it to the Regional Director. In no case is the employer advised regarding the specific details of the complaint. Secretary Ahearn advises that the form violates constitutional safeguards against compelling one to act as a witness against himself. It also serves as a shot in the dark and carries the imprint of an attempt to enforce the Act by intimidation. He also has suggested that members request complete information regarding the alleged violation before filling out the form. The Association will extend its help.

In explaining the purpose of the form, Baird Snyder, Deputy Administrator of the Wage and Hour Division, reported that 30,000 complaints alleging violations of the Act by various employers are on file, and that it is humanly impossible to inspect all the establishments complained against immediately or in the near future. The form was therefore devised to permit the employer to determine himself whether he might be violating the law. Mr. Snyder in his letter states, "If he is violating, he can protect himself from contingent liability inherent in the violation by ceasing to violate. Few of these complaints are specific enough that we could tell the employer what violation is alleged. On the other hand, the AD-85 form, if properly filled out, will tell the employer whether he is covered by the Act and whether he is violating it."

Roads for Defense

AMERICAN ROAD BUILDERS' ASSOCIATION has announced that the 1941 convention will be held in New York, N. Y., January 27 to 30. The theme of the convention will be "Roads for Defense." Outstanding military authorities and representatives of the U. S. War Department will participate in an open forum on military roads.

COMING CONVENTIONS

National Safety Congress, Stevens Hotel, Chicago, October 7-11.

National Sand and Gravel Association and National Ready Mixed Concrete Association, Netherland Plaza Hotel, Cincinnati, January 15, 16 and 17.

National Crushed Stone Association, Netherland Plaza Hotel, Cincinnati, January 20, 21 and 22.

American Road Builders' Association, New York City, January 27, 28, 29 and 30.

National Concrete Masonry Association, Sherman Hotel, Chicago, February 10, 11, and 12.

American Concrete Institute, Mayflower Hotel, Washington, D. C., February 18, 19, and 20.

Silver Anniversary

THE NATIONAL SAND AND GRAVEL ASSOCIATION will hold its Silver Anniversary convention in Cincinnati, January 15, 16 and 17, and special features have been announced for the program which is now being prepared.

Power Show

THE NATIONAL EXPOSITION of Power and Mechanical Engineering will be held in the Grand Central Palace, New York, December 2 to 7, coincident with the annual meeting of The American Society of Mechanical Engineers. More than 270 companies have already reserved space for the exhibit.

New York Crushed Stone Association Outing

HARRY R. HAYES, secretary and engineering director, New York State Crushed Stone Association, Inc., reported that the annual outing, held on September 5, was a huge success, with 130 members and guests present at the Schyler Meadows Golf Club, Loudonville, near Albany, N. Y. The main golf event was a team match between members of the New York State Public Works department and members of the New York State Crushed Stone Association. The large silver cup which in 1939 was won by the Public Works Department team was won this year by the association team composed of the following: Wilson P. Foss, Jr., and J. Q. Taylor, New York Trap Rock Corp.; R. A. Sharron, Plattsburg Stone Products Corp.; Walter T. Bronson, Ronald Kinnear, Charles Callanan, and J. Reid Callanan, Callanan Road Improvement Co.; William H. Peckham and Mr. Marquout, Catskill Mountain Stone Corp.; and William Hess of the Solvay Sales Corp. Winners of other contests were as follows: Approaching, J. R. Boyd, National Crushed Stone Association; Putting, G. D. Fraunfelder, Easton Car and Construction Co.; Driving, Charles Callanan, Callanan Road Improvement Co., with a drive of 250 yards; Horseshoe Pitching, Guy W. Faylor, General Crushed Stone Co.; and Poker Championship, Avery Bullen, Defiance Corp.

Oxides Extracted In Merriman's Test of Portland Cement

CHEMISTS' CORNER

By E. P. FLINT*
and P. H. BATES*

IN DISCUSSIONS regarding the Merriman sugar test of portland cements practically no data have been presented showing, as the results of chemical analyses, the amounts of the several cement constituents dissolved by the sugar solution. When the National Bureau of Standards was requested by a Government agency to obtain the sugar titration values of some cements which it was purchasing, the Bureau decided it would be of interest to determine the amounts of the oxides extracted by the sugar solutions from the cements. The results are given in Table 1. In Table 2 are given the analyses of the cements before extraction.

Cements A-1 to A-4 in Table 1 are four lots of the same brand. Similarly, B-1 to B-3, and C-1 and C-2 are lots of two other brands. These three brands of cement were being purchased by the Government agency. The results obtained from these were so interesting that the remainder of the samples (D-K, Tables 1 and 2) were taken from clinkers and cements under study at the Bureau in other investigations. The samples of clinker, secured from a number of mills, were ground to a specific surface of approximately 1800 sq. cm. per gram with (-ct) and without (-ck) the addition of gypsum.

It may be of interest to indicate why these particular clinkers and cements were selected. Cement D has an unusually low A/F ratio. Cement E is low in silica. Clinker F is characterized by a very high K_2O content. Clinker G is a white portland cement clinker. H is outstanding on account of its high Na_2O plus K_2O content. I and J were selected because they represented a standard- and a moderate-heat-of-hardening clinker, respectively, from the same mill, and K because it was an unusually high-silica, low-iron oxide and alumina cement of the low-heat as well as the sulphate-resisting type.

Although the data presented here cover a great deal of analytical work, it is quite evident that they do not represent a great enough variety of cements or cements whose production history is known to permit drawing any positive general conclusions regarding the fundamental nature of the test or its significance. Hence, in the following there are presented some statements regarding a number of the outstanding features of the test data.

Observations of Test Data

1. Of the 23 samples under observation, only five had a total titration value of 10.1 ml or less. Hence, the majority were unsatisfactory so far as the Merriman test was concerned.

2. It is evident that with few exceptions, and these are mostly with those cements which gave low titration values, all the constituents in the cement go partly into solution. There does not seem to be such marked preferential solution of any one constituent as would permit the presence of other constituents to be neglected. The large amounts of silica and iron oxide dissolved are likely surprising to many.

3. Lime is present in solution in

*Division of Clay and Silicate Products, National Bureau of Standards.

TABLE 1. ANALYSIS OF MERRIMAN SUGAR EXTRACTS

	Merriman Titration ml of N/2 HCl		Composition of extract, g/100 ml								Calculated compounds in solution expressed as percentage of sum of all dissolved oxides					
Cement	First end point	Total clear point	SiO_2	Fe_2O_3	Al_2O_3	CaO	MgO	SO_3	Na_2O	K_2O	C_4AF	C_3A	C_3S	C_2S	$CaSO_4$	CaO in excess
A-1	30.2	40.6	0.375	0.316	0.340	1.787	0.056	0.002	0.020	0.075	32.3	12.3	48.0	0.0	0.1	2.2
A-2	30.6	43.1	0.448	0.298	0.399	1.807	0.049	0.003	0.022	0.073	29.3	17.1	26.9	21.2	0.0	0.0
A-3	30.2	42.5	0.351	0.293	0.387	1.800	0.055	0.003	0.016	0.038	30.0	17.8	44.2	0.0	0.2	2.5
A-4	32.1	45.4	0.397	0.300	0.366	1.878	0.052	0.002	0.030	0.057	29.6	15.0	49.0	0.0	0.1	1.8
B-1	33.3	49.2	0.416	0.290	0.644	2.071	0.065	0.005	0.019	0.065	24.7	34.0	14.6	22.5	0.0	0.0
B-2	36.3	52.8	0.401	0.367	0.438	2.268	0.065	0.003	0.009	0.021	31.3	15.1	42.6	0.0	0.1	8.1
B-3	38.4	57.4	0.478	0.329	0.675	2.510	0.083	0.005	0.013	0.014	24.4	28.6	38.3	4.5	0.0	0.0
C-1	33.9	43.5	0.324	0.222	0.516	1.823	0.046	0.004	0.020	0.053	22.5	32.9	39.1	1.4	0.0	0.0
C-2	30.5	44.7	0.350	0.231	0.479	1.812	0.046	0.004	0.023	0.073	23.3	29.2	38.3	4.4	0.0	0.0
D	1.9	1.9	0.008	0.000	0.003	0.165	0.001	0.081	0.002	0.001	0.0	3.4	11.5	0.0	52.9	30.3
E	4.4	4.6	0.025	0.003	0.003	0.322	0.001	0.171	0.016	0.059	1.5	0.5	15.8	0.0	48.5	21.0
F-ck	21.7	31.5	0.133	0.186	0.391	1.234	0.025	0.002	0.010	0.091	27.3	34.9	24.4	0.0	0.1	7.3
F-ct	4.9	5.5	0.050	0.014	0.014	0.284	0.003	0.091	0.012	0.084	8.0	2.4	34.4	0.0	28.1	9.4
G-ck	36.4	45.7	0.350	0.023	0.276	2.020	0.021	0.000	0.003	0.013	2.6	25.6	49.2	0.0	0.0	21.3
G-ct	23.8	27.4	0.013	0.019	0.091	1.375	0.013	0.005	0.002	0.009	3.8	13.7	3.2	0.0	0.6	77.1
H-ck	27.3	42.0	0.325	0.200	0.370	1.565	0.049	0.008	0.047	0.046	23.3	24.6	43.2	3.1	0.0	0.0
H-ct	4.8	5.1	0.004	0.013	0.010	0.277	0.003	0.084	0.023	0.025	9.1	1.1	3.4	0.0	32.6	42.4
I-ck*	39.6	60.0	0.252	0.229	0.693	2.338	0.070	0.005	0.016	0.017	19.3	40.1	26.5	0.0	0.2	11.1
I-ct*	32.0	47.6	0.145	0.188	0.853	2.020	0.058	0.006	0.019	0.016	17.3	58.6	16.7	0.0	0.3	4.1
J-ck	25.3	37.0	0.286	0.382	0.331	1.518	0.063	0.005	0.014	0.024	44.3	8.8	41.4	0.0	0.3	1.2
J-ct	10.6	13.0	0.047	0.095	0.038	0.611	0.015	0.012	0.010	0.018	21.5	0.0	21.2	0.0	2.4	41.4
K-ck	16.4	21.4	0.228	0.141	0.130	0.980	0.021	0.005	0.004	0.011	28.2	7.0	57.0	0.0	0.6	4.9
K-ct	8.6	10.1	0.032	0.046	0.024	0.560	0.008	0.082	0.005	0.009	15.0	0.0	15.9	0.0	18.1	46.0

A-1 to A-4 = 4 lots of cement from Mill A. B-1 to B-3 = 3 lots of cement from Mill B. C-1 to C-2 = 2 lots of cement from Mill C. D = cement with low A/F ratio. E = cement with low SiO_2 content. F-ck and F-ct, G-ck and G-ct, etc. = ground clinker and cement (Laboratory ground from the same clinker) respectively from Mills F, G, etc. G-ck = White clinker. I-ck = Standard cement clinker and J-ck = Moderate heat clinker from the same mill.

*These extracts were more deeply colored than others containing larger amounts of Fe_2O_3, probably because of a relatively high manganese content of the clinker and cement.

greatest amount. Next in amount is alumina, then silica (though note that in ten cases silica exceeds the alumina), then iron oxide, followed by smaller quantities of the volatile alkalies (Na_2O and K_2O), magnesia and sulphur trioxide.

4. The relatively large amounts of Na_2O and K_2O in the solution, although they occur in the cements in such small quantities, are noteworthy. In three cases the sum of these oxides was greater than the amount of SiO_2, Al_2O_3 or Fe_2O_3. These data confirm other analyses of water extracts of cement which show that these oxides go into solution very promptly after the cement and water are mixed.

5. The very small amounts of dissolved sulphur trioxide are also surprising. Note particularly that when the titration values are low, the relative amounts of SO_3 are high. In these cases this oxide is present in greater amounts than any of the other oxides except the lime.

6. When the titration values are low, it is evident that the dissolved magnesia is low.

7. Calculating the dissolved oxides to the compounds assumed to exist in the cements brings out some striking facts. In 12 of the 23 cases, the C_4AF has gone into solution to a greater extent than the C_3A. In 17 of the 23 cases the two silicates together have dissolved to a greater extent than the aluminate or aluminoferrite.

8. The lime in excess of that required by calculation to combine with the other oxides is high in those cases where low titration values were obtained. This may be the reason why the dissolved magnesia is low in these cases.

9. In the instances where the titration values are low, the large amounts of dissolved calcium sulphate and of lime in excess of the calculated compounds are noteworthy.

10. In the six cases where it is possible to compare clinker ground without and with the addition of gypsum, it is seen that the addition of the gypsum gave a marked reduction in the titration values. For these cases, in the absence of the gypsum (-ck), the values were too high for acceptance, according to the Merriman test, while in the presence of the gypsum (-ct), the values were satisfactory in three cases (F-ct, H-ct, K-ct). A reduction of a value of 42.0 to 5.1 through the use of the gypsum is indeed noteworthy.

11. In the cases referred to in the preceding paragraph, the clinker ground in the presence of the gypsum showed a marked reduction in the amounts of the silicates, aluminates and aluminoferrite dissolved and a marked increase in excess lime. It would seem as though, in the cases of the ground clinker, solution of the constituents takes place to a greater degree than with the cement where apparently hydrolysis more than solution seems to have taken place. An alternative possibility is that the Fe_2O_3 and Al_2O_3 extracted by the sugar solution may have been precipitated as calcium sulphoaluminate and calcium sulphoferrite, by reacting with dissolved gypsum.

12. In five of the six cases the results obtained with the ground clinkers and the cements prepared from them show that the test cannot be considered as an indication of the degree of clinker burning. If the test were indicative of the degree of burning, it would not be likely that the presence of the gypsum alone should produce such a marked reduction of titration values and reduction in the dissolved oxides (with one exception) as found. But the single exception is outstanding and leaves one in doubt as to the significance of the test so far as degree of burning is concerned.

13. It is very evident that too few data are at hand from this brief study of a few cements to permit drawing any generalizations as to the reactions of the sugar solution with the cements. It is hoped, however, that those engaged in studying and using the test will extend their work to include determinations of the dissolved oxides. The results presented here seem to indicate this to be most essential.

Relieving Conveyor

(Continued from page 30)

in this manner, plus an even greater dead storage.

The tunnel with a 12-ft. clear inside width and 11½-ft. clear head room under the duplex gates, is for direct truck loading. All material not recoverable in this manner is handled either with a small shovel or a bucket loader on crawlers.

Development of this type of storage is credited to the owner. Prior experience in an earlier plant, combined with structural improvement by the designers of the new plant, have produced a most satisfactory result.

At 150 cu. yd. per hour this plant is not being "pushed." The simple and effective flow sheet combined with over-size machinery units provide much higher capacity than this under any approximately normal conditions. Relatively wide changes in ratio of sand and gravel as fed to the plant are handled with ease.

The sand classifying tanks have a capacity of 27 cu. yd. per hour for plaster and masons sand and over 100 cu. yd. per hour of concrete sand. Crushing capacity down to 1½ in. is well over what was considered necessary. Screen area is adequate for all demands.

Connected electrical horsepower totals 135 hp., all Continental motors, including 5 hp. for the scalping screen and return conveyor, 7½ hp. for the primary conveyor and final sizing screen, 10 hp. for the main conveyor, 40 hp. for the secondary crusher, and 60 hp. for the primary crusher.

TABLE 2. COMPOSITIONS OF THE PORTLAND CEMENTS AND CLINKERS USED IN INVESTIGATION OF MERRIMAN TEST

Brand	SiO_2 %	Fe_2O_3 %	Al_2O_3 %	CaO %	MgO %	SO_3 %	Na_2O %	K_2O %	Ignition loss %	Insoluble %	Free CaO %
A-3	21.1	3.1	5.4	63.3	3.7	1.9	—	—	1.3	0.1	0.4
B-1	21.4	3.0	6.0	64.4	2.6	1.6	—	—	0.9	0.1	0.3
C-2	20.9	2.5	7.0	62.7	3.6	1.9	—	—	0.9	0.1	0.5
D	23.1	5.4	3.4	63.6	0.4	1.8	0.55	0.04	1.8	0.3	0.1
E	19.3	3.1	6.5	63.7	3.3	2.4	0.29	0.50	1.0	0.1	0.6
F-ck	22.2	2.4	6.3	64.1	2.9	0.5	0.09	1.32	0.9	0.3	0.4
F-ct	21.5	2.3	6.1	63.1	2.8	2.0	0.09	1.28	1.5	0.3	0.4
G-ck	24.8	0.5	4.5	64.1	1.0	0.04	0.03	0.25	5.3	0.3	5.3
G-ct	23.9	0.5	4.3	62.9	1.0	1.8	0.03	0.24	5.9	0.3	5.1
H-ck	22.1	2.5	5.5	64.7	2.6	0.3	0.62	0.53	1.3	0.2	0.9
H-ct	21.3	2.4	5.3	63.5	2.5	3.0	0.60	0.51	2.0	0.2	0.9
I-ck	22.0	2.2	6.8	65.3	2.6	0.4	0.19	0.18	0.6	0.3	0.8
I-ct	21.2	2.1	6.6	64.1	2.5	2.1	0.18	0.17	1.4	0.3	0.8
J-ck	22.4	4.6	4.9	64.6	2.1	0.3	0.17	0.20	0.5	0.2	0.6
J-ct	21.6	4.4	4.7	63.4	2.0	2.1	0.16	0.19	1.3	0.2	0.6
K-ck	26.5	2.8	2.6	65.7	1.6	0.2	0.13	0.26	0.6	0.3	0.8
K-ct	25.5	2.7	2.5	64.5	1.5	1.9	0.13	0.25	1.4	0.3	0.8

Hints and Helps

★ FOR SUPERINTENDENTS ★

Easy Method of Relocating Quarry Trackage

THE ACCOMPANYING ILLUSTRATIONS show how quarry tracks are moved by the Virginian Limestone Corp. at Ripplemead, Va. By hanging a cable sling from the dipper teeth of a

Two views showing how shovel and cable sling are used to relocate track in quarry. Note tongs at each end of sling which grip the heads of the rails

Bucyrus-Erie shovel, the rails with ties attached are lifted up and moved to their new location nearer and parallel to the quarry face. The rails are moved the width of the next cut or 48 ft. laterally for their entire length. About 1000 ft. of trackage is handled in this way which requires moving the shovel up and down the length of track twice to complete the job. After ballasting, the track is ready for operation without the spiking of any ties. The company uses a third-rail Woodford electric haulage system.

How an Expert Lubricates Bearings

By W. F. SCHAPHORST

IN DISCUSSING lubrication problems with an internationally known lubrication expert not long ago, he informed me of interesting instances where he does the diametrical opposite of what is commonly done in lubrication, namely, he adds lubricant on *stopping* the drive instead of when *starting* it. He doesn't merely add a few drops with an oil can; he turns on a sight feed oiler, a method that was quite new to me. I think it will interest most operators of machinery who may occasionally run into lubrication difficulties of this type.

He explained to me that he resorts to this method only in connection with the lubrication of ball and roller bearings where the bearings are adjacent to a source of high temperature. In other words, it is his pet scheme for successfully lubricating bearings which ordinarily give trouble due to excessive heat.

I asked, "Why do you do it in that way? Is it for the purpose of adding a new supply of oil, or, does the oil serve as a coolant?"

"No," he informed me, "I do it in order to keep the grease from hardening. On giving the matter thought you can readily see that if the oil were applied directly to the grease while the motor is in motion it would not have a chance to be absorbed by the grease because centrifugal force would cause the oil to throw. In this manner I have been successful in taking care of surprisingly high temperatures."

Sorting Aggregates to Eliminate Flat Pieces

AGGREGATE PRODUCERS will find the sorting device developed by W. M. Dunagan, Iowa State College, and described in *Engineering News-Record* of unusual interest at this time when so much attention is being given to the elimination of flat pieces in gravel and crushed stone. Mr. Dunagan developed the equipment illustrated to separate gravel into rounded and flat, and the stone into cubical and elongated pieces.

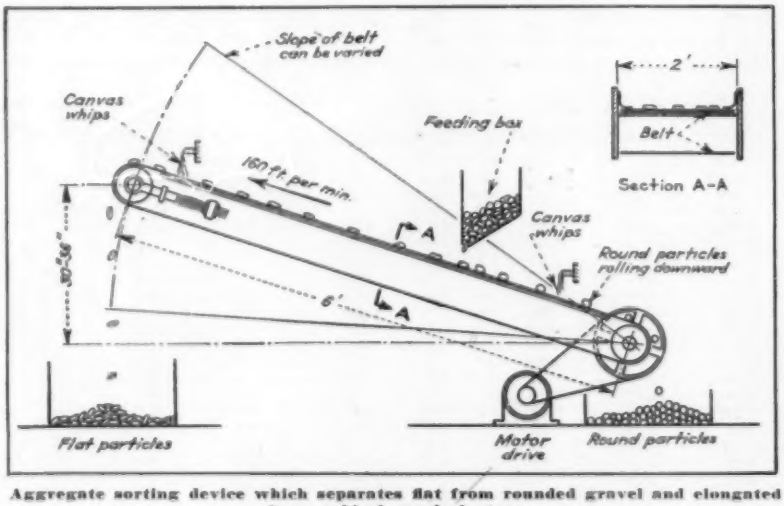
The effectiveness of separation is very definitely influenced by the slope of the belt. In making tests of aggregates, Mr. Dunagan kept the slope of the belt constant. Other factors affecting efficiency involve the speed of the belt and the material of which it was made. Performance was satisfactory, large quantities of aggregates being separated in a short time with an efficiency of about 90 percent.

Handling Limestone at Low Cost

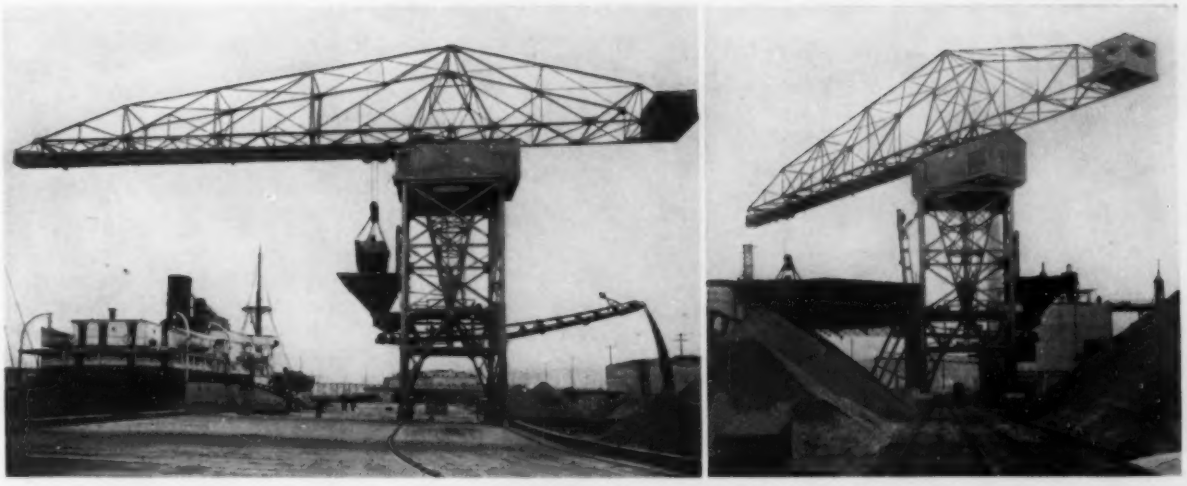
By ROBERT C. HILL

WHEN ENGINEERS designed the Seattle Diamond plant operated by Superior Portland Cement, Inc., several outstanding problems had to be solved (see ROCK PRODUCTS, Dec. 7, 1929, pp. 33-51). The rock, which comes from the quarries of the Pacific Coast Cement Co. at View Cove, Dall Island, Alaska, a distance of about 650 miles by water from Seattle, is crushed to minus 1¼ in. The company's freighter "Diamond Cement" hauls the material to the plant, making a round trip to the quarry and return in six days.

Discharge from the boat is accomplished by means of a Colby, 15-ton, pintle-type, traveling hammer head crane, designed and built by the Colby Steel & Engineering Co., which operates a 4-cu. yd. clamshell special type S bucket, manufactured by the Owen Bucket Co. Under the time schedule the vessel must be on her way 24 hours



Aggregate sorting device which separates flat from rounded gravel and elongated from cubical crushed stone



Left: Pintle-type, traveling crane discharges crushed limestone from ship's hold to hopper which feeds conveyor. Right: Clam-shell bucket used to transport rock from storage to mill

after arrival. The bucket weighs approximately 13,000 lb. and the total lift averages 14 tons. To handle 250 tons an hour means 30 or more complete movements from ship to hopper, or about one hoist every two minutes.

One of the most important items in this successful method of quickly handling large quantities of heavy rock is the wire cable used to operate the bucket. Two lengths of ¾-in. preformed wire rope are standing the stress and strain of this job. One length is 325 ft. long, the other reaved into the bucket is 370 ft. long. Preformed rope has been found far superior to standard rope and best suited to the hard and exacting conditions of this job.

The Colby crane has several special attachments, designed to meet the peculiar problems of the cement plant. The crane has a boom 160 ft. over all, 100 ft. operation, and travels on a 20-ft. gauge track. The high speed necessary could not be maintained if the bucket dumped directly on the storage piles, due to the time lost in rotating the boom. Consequently a hopper is used into which the bucket discharges after clearing the top of the hatch and with a combined vertical and horizontal movement reaching the hopper in the minimum distance.

Discharge from the hopper by means of side and bottom openings is made uniform by means of a Link-Belt feeder pan with an endless metal belt about 8-ft. long. This controls the flow, obviates clogging and deposits a steady stream on a 30-in. rubber belt conveyor which extends on a hinged arm 27-ft. beyond the crane structure. From the end of the conveyor the material pours onto the storage piles which reach a maximum height of 28 ft. The conveyor can be adjusted as desired and when not in use is folded up on the crane structure and does not interfere with other operations.

The storage capacity of the yard is about 115,000 tons, so arranged that any section is accessible to the crane which travels around a 100-ft. radius track to the back storage area at right angles to the dock. To conserve space a turntable is installed in the middle of the pier so that the huge crane can turn on its own axis.

Installed in 1928, this crane was first used in construction of the plant and since then has been the main cog in handling materials from shipside to the mill. It is capable of four movements at the same time controlled by the operator in the cab, including lifting the load, racking load carriers out on the boom, swinging the boom and traveling on the track. It is equipped with a system of colored lights on the boom indicating the position of the bucket, an attachment that is found particularly useful in foggy weather. More recently a "voy-call" system has been installed wherby verbal directions can be transmitted to the operator, the other end placed aboard ship or elsewhere as desired.

When the ship is discharging, limestone is deposited in four piles opposite each of the four hatches, entailing the minimum movement. At low tide, the maximum lift is close to 100 ft. from the bottom of the hold. Discharge naturally slows as the bucket goes deeper into the hold but the average of more than 250 tons an hour is maintained. The maximum distance the material is moved is 350 ft., most of it much less.

Between calls of the steamer, the crane and bucket are usually operated two shifts a day moving materials from the farther storage piles, to within reach of a Milwaukee bridge crane, 70 ft. wide, on which is operated a 3-cu. yd. bucket. The latter discharges into three hoppers leading to the ball mills.

While all equipment is maintained at the highest levels of efficiency and safety, particular attention is paid to the hammerhead crane, the sparkplug of the handling system. Consequently materials of high quality are essential and this applies in particular to the wire cable operating the bucket. When the cable has passed the peak of efficiency it is replaced with new lengths, as no chances are taken of a mishap involving lives and property damage. However, on the bridge crane conditions are less exacting and the danger of injury less acute. For this operation used preformed wire rope from the hammerhead crane is transferred to the bridge crane on which there are three cables—one 95 ft. long, two 68 ft. long, the lift being 40 ft. By this method full service is obtained without impairing plant efficiency or subjecting personnel or property to unnecessary risk.

Rubber Ear Pads for Air-Raids

AIR-RAIDS over Great Britain have led to development of ear pads in soft aerated rubber which are fixed over the respirator. The ear pads, as described in *The Quarry Managers' Journal*, disperse the blast from an explosion before it reaches the ear drums and yet allow the wearer to hear ordinary conversation or the sound of a siren. This protective device may have an application in this country for the use of powdermen or drillers who find it necessary to work near blasting operations.

NEWS ABOUT PEOPLE

HOLGER STRUCKMANN, for some years in the engineering department of the Lone Star Cement Corp., and more recently assistant superintendent at the New Orleans plant, is now assistant to W. R. Bendy, who has been in business as a cement engineer for the past two years. Mr. Struckmann is a nephew of H. Struckmann, former president of Lone Star Cement Co.

•

REED C. BYE, vice-president, director and member of the operating committee of the Warner Co., Philadelphia, will celebrate his twenty-fifth anniversary with the company this fall. During these years he has covered nearly every field of activity in the company and now has executive supervision of the Wilmington retail division and general sales supervision of lime and limestone products for both the Warner Company and the American Lime & Stone Co., a Warner subsidiary.

In addition to his company affiliations Mr. Bye's interests in the industry include being a director of the Quality Lime Institute, which deals with promotion of lime in the Middle Atlantic States, and director and member of the executive committee of the National Lime Association.

•

A. I. DEHUFF has been appointed superintendent of Lehigh Portland Cement Co.'s plant at Metaline Falls, Wash. With the company since the Metaline Falls plant started operations in 1911, he has been supervising chemist and later production engineer. During the illness of his predecessor, the late H. H. Helwig, he took active charge of the plant.

•

JAMES R. WHITE, president of Rickard & Co., New York City advertising agency, has been appointed national director of the industrial, business and trade publicity section of the Republican National Committee.

•

P. C. VAN ZANDT, vice-president of the Universal Atlas Cement Co., gave an address on the "Contribution of Free American Enterprise To Preparedness" at the American Legion Convention, Department of New York, at Schenectady, on August 29.

•

JAMES GAGER of the Gager Lime Mfg. Co., was married to Miss Eleanor Gerwig, August 31, in Chattanooga, Tenn.

•

STANTON WALKER, director of engineering for the National Sand and Gravel Association, and George C. Ernst, professor in the department of civil engineering at the University of Maryland, are to be in charge of a new course dealing with the theory of concrete mixtures at that school during the coming year.

M. P. Greer, safety engineer of the Marquette Cement Manufacturing Co., at Cape Girardeau, Mo., to whom no small measure of credit should be given for the Cape Girardeau plant's safety achievement, making it a member of the 1000-Day Club of the Portland Cement Association. Only three other companies have attained the distinction of operating 1000 consecutive days without a lost-time accident

WILLIAM A. CUNNINGHAM has been retained by the Texas Gypsum Mining & Construction Co., Houston, Tex., as consulting engineer. He is also research technologist in the Bureau of Industrial Chemistry at the University of Texas and is on the staff of the chemical engineering department at the University.

•

CARL A. NULTY, assistant sales manager of Ash Grove Lime and Portland Cement Co. at Omaha, Neb., has been promoted to sales manager, succeeding the late J. A. Rockwell.

•

DR. J. V. N. DORR, president of the Dorr Co., Inc., has been elected to receive the Perkin Medal of the Society of Chemical Industry for 1941. This is an annual award for valuable work in applied chemistry. Dr. Dorr's inventions include the Dorr classifier, thickener, agitator, and continuous counter current decantation.

•

J. CHARLES CARTER has been made chief electrician at the Iola, Kan., plant of Lehigh Portland Cement Co. He succeeds C. E. Kietzman, who was recently appointed assistant superintendent of the Dewey Portland Cement Co., Dewey, Okla.

•

MRS. JOSEPH COOK is one of the few women holding an executive position in the rock products industry. She is secretary of Cook & Co., Portland, Me., and also serves as its bookkeeper. Mrs. Cook has been associated with the company from its founding to its present size, comprising a quarry at the site of the office, a gravel pit and plant at Scarboro, and a fleet of transit mixer trucks.

•

LOUIS J. HOENIG, sales manager of the Nebraska Cement Co., has been appointed general manager of the company's plant at Superior, Neb. He has been connected with the company since its inception more than twenty years ago.

•

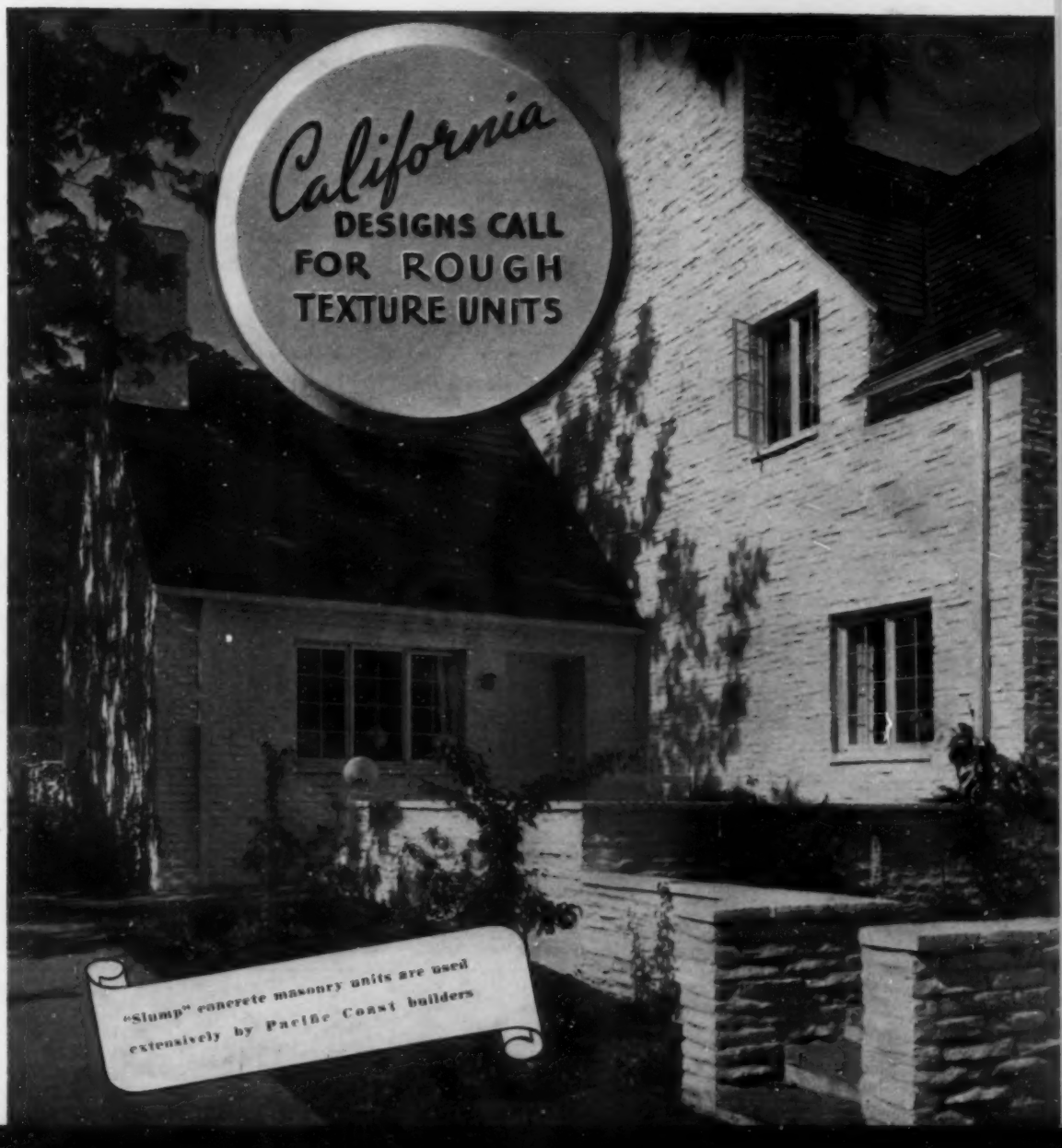
DON COULSON, superintendent of the Nebraska Cement Co., has resigned to accept a position with the Standard Lime & Stone Co. of Martinsburg, W. Va.

•

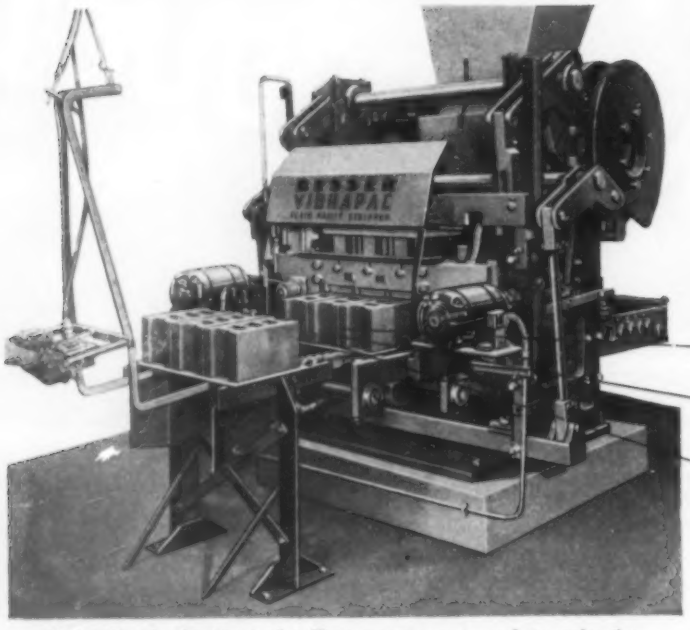
CHARLES K. LEITH, professor of geology at the University of Wisconsin, has been named by Edward R. Stettinius, Jr., as an assistant in the task of coördinating the flow of industrial raw materials from mines to factories.

(Obituaries appear on page 86)

CONCRETE PRODUCTS AND CEMENT PRODUCTS

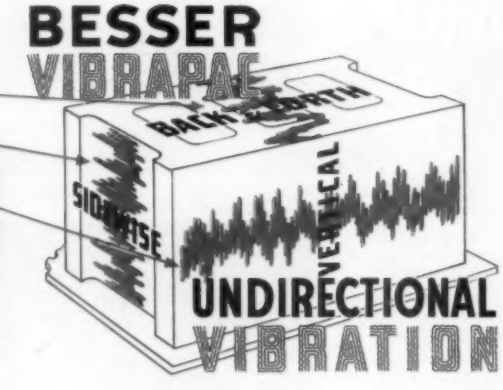

California
DESIGNS CALL FOR ROUGH TEXTURE UNITS
"Slump" concrete masonry units are used extensively by Pacific Coast builders

50% Greater Production



NO MACHINE OPERATOR
ONE MAN OFFBEARING—POWER HOIST
PLAIN PALLETS FOR ALL UNITS
4800 8" EQUIVALENT UNITS PER 8 HR. DAY

Full Patent Protection



Undirectional vibration under Flam patents was used to make the first vibrated blocks ever made on a production basis and sold commercially.

BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic	8 Hr. Capacity 3120
	Besser Victory Automatic	8 Hr. Capacity 2160
	Besser Semi-Automatic	8 Hr. Capacity 1680
	Besser Champion, Power Operated,	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated,	8 Hr. Capacity 250 to 350
VIBRATORS	Besser Super Automatic Vibrapac	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac	8 Hr. Capacity 2160
	Besser Master Vibrapac, Hand Operated,	8 Hr. Capacity 800

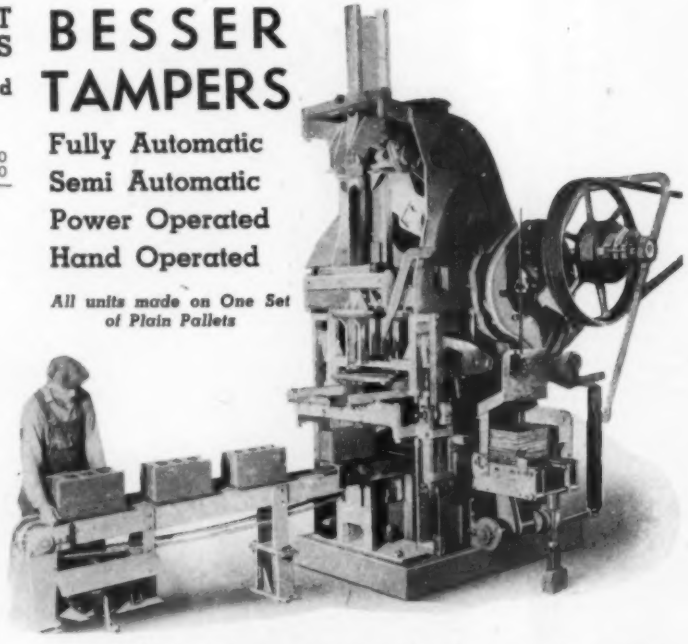
Write NOW for details. State sizes and production wanted.

All Besser Automatic Block machines—Vibrators and Tampers—make FULLY PRESSED TOP blocks.

BESSER TAMPERS

Fully Automatic
Semi Automatic
Power Operated
Hand Operated

All units made on One Set of Plain Pallets



Besser Super Fully Automatic Plain Pallet Stripper with Mixer, Skip Loader, Automatic Pallet Feeder and Automatic Front Conveyor.

BESSER MANUFACTURING CO., 210 40TH ST., ALPENA, MICHIGAN

Newspaper Ads Sell Ready Mix

Supplement advertising with personalized letters. Also feature heated concrete

Sales letter sent to prospective home builder to which photograph is clipped to attract attention

NEWSPAPER ADVERTISING is considered by a large number of producers in the industry as a debatable medium to promote the use of ready-mixed concrete. The cost of so-called waste circulation in consumer advertising has been the principal objection. However, planned newspaper advertising has been the principal means of developing a volume business in Grand Rapids, Mich.

Grand Rapids Gravel Co., operating two sand and gravel plants in Grand Rapids, pioneered ready-mixed concrete in the Fall of 1937 when a central mixing plant was built at the site of its main gravel plant.

Volume Increased With Newspaper Advertising

Grand Rapids, a city of 180,000 population, is considered conservative, and contractors, builders and architects had to be sold on the idea of any new construction material. Industrial plant construction and home building are equally important outlets for concrete in the city.

Until November, 1938, one truck mixer was sufficient to handle the business. Heating equipment for winter operation was then installed and an organized campaign of newspaper advertising and direct mail started. Growth in volume of business paralleled the promotion program, and the company now has eight truck mixers serving all types of construction projects, Henry N. Battjes, president of the company, says that the volume of ready-mixed concrete sold in 1939 exceeded that of 1938 by $100,000. During 1939, $3000 was spent for newspaper advertising.

When Mr. Battjes decided to advertise he planned a long range program and engaged the Webber Advertising Agency of Grand Rapids to handle it for him. Both the *Grand Rapids Herald* and *Grand Rapids Press* are used and the advertisements are placed in the building section of each newspaper weekly. A message is carried in the one paper on Saturday and in the Sunday edition of the other.

Space is standardized, using three 7-in. columns or a total of 21 in. which is of sufficient size to use attractive copy, usually containing an illustration and plenty of bold-faced type. Smaller ads are occasionally carried as rate holders and, in addition, 3-in. ads are run in the Monday business review section of the *Grand Rapids Herald*.

Advertising copy to date, with the exception of the business review ads which are directed to industrial men, is part of a campaign for consumer education. The consumer very often specifies what the contractor should use and copy is planned to encourage the consumer to try it.

The group of ads shown are part of a series now being run which are planned to follow a theme, emphasizing the popular acceptance of prepared commodities. A comparison is drawn between ready-mixed concrete and other ready-prepared commodities, impressing upon the reader the advantages of producing scientifically the various commodities he now buys and the new one he should buy—ready-mixed concrete.

Ready mixed concrete plant, to the left, designed and equipped for winter operation. Gravel plant to the right

You buy CANDY ready to eat
You buy BREAD ready-baked
You buy COFFEE ready-blended
You buy ready-made
Buy CONCRETE Ready-Mixed
It's the MODERN WAY
Today's shoes are precision made — and so is today's modern concrete. Contractors prefer the precision methods of Ready-Mixed Concrete. It is scientifically mixed in a large central plant eliminating all guesswork. Here, pre-screened aggregates of specific sizes are carefully measured by weight before batching with precisely determined cement and water ratios. No construction is delayed when Ready-Mixed Concrete is ready for pouring at the precise time wanted. Concrete is delivered heated. Cold weather doesn't affect pouring of Ready-Mixed. It's production tie-up is avoided. Then, traffic and
Specify READY-MIXED CONCRETE
GRAND RAPIDS GRAVEL CO.
GRAND RAPIDS, MICH.
DAY PHONE 5-1101
NIGHT PHONE 5-3046

Series of newspaper advertisements all on a single theme, comparing ready mixed concrete with other commonly purchased and ready to use commodities

Each ad in the series features in the body type certain advantages of buying ready-mixed concrete, including uniformity of product, accuracy in proportioning, freedom from voids on the job, strength, reduction of delays to construction, elimination of job-handling equipment, time saved in cleaning up, excellence of finish on the job, imperviousness of the wall when poured, etc.

Heated Concrete a Specialty

It will be observed that each advertisement contains some reference to the availability of heated ready-mixed concrete regardless of temperature and icy conditions. Construction has been revolutionized in Grand Rapids since the introduction of heated concrete. Formerly no concrete was poured in extremely cold weather, but concrete construction is now done the year around even at temperatures below zero. Some of the ads suggest that the Grand Rapids Gravel Co. be called for the names of contractors using ready-mixed concrete.

A public relations program is part of the advertising agency's service. The agency coöperates in getting good job photographs which can be featured in the newspapers and in direct mail. Representatives of the agency have been instrumental in getting outstanding jobs featured gratis in the editorial columns of the newspapers. These news releases are considered of even more value than the paid messages. All the ads contain the day and night telephone numbers of the company so that it is known that many direct requests come as a result of the advertising.

Direct mail is also used to advantage in promoting the use of ready-mixed concrete. A planned schedule is followed in getting timely letters into the hands of contractors and architects. These letters continually stress the advantages of the product. During the winter months the letters contain important facts about placing and handling concrete in the winter.

The main objection to direct mail is that too often each piece is considered just another form letter and a big proportion end up in the waste basket without being read. Mr. Battjes guards against this and creates a desire to read each letter by clipping to it an attractive 2½- x 4-in. snapshot showing the handling of ready-mixed concrete from the truck mixers into the forms on the job.

Well-Equipped Plant

Modern merchandising necessitates the latest production facilities. The Grand Rapids Gravel Co. has a well-equipped plant connecting to its sand and gravel bins for the transfer of drained aggregates by belt conveyor directly into the concrete bins. There are also provisions for elevating aggregates trucked from stockpiles. Aggregates storage is 165 tons in three compartments in a Butler-equipped plant. A fourth compartment contains the cement, which is received in bulk. An additional cement bin provided for state work is equipped with locked scales for the use of state inspectors.

Special cements are handled in sacks, and the company is not at all reluctant to prepare special mixes. Pigments are also occasionally added to produce colored concretes, in conformance with a policy which is to *serve* any type of job.

The entire batching plant is enclosed for winter operation. Steam is used to heat aggregates and the mixing water, permitting delivery of concrete at 70 deg. F. regardless of the weather or temperature. Oil was recently discovered on the gravel property of the company, which now has nine producing wells. Gas from these wells is piped to the plant to fire the steam boiler which develops operating steam pressures of 30 p.s.i. Live steam jets are used in the gravel bins and coils in the sand bins. Sand is heated by radiation through the steel coil walls to better control the moisture contained in the sand. Eight Jaeger and Rex truck mixers, of 2½-cu. yd. and 3½-cu. yd. mixing capacities, now do all the mixing in preference to the use of a central mixer and merely agitating in the drums.

Ready-mixed concrete was added as part of the company's policy to diversify. Fully 50 percent of its business is now made up of specials, including ready-mixed concrete, clay-binder road mixes, retread gravel, bituminous mixes, special crushed products, chips, etc.

Colored Plaster Winning Favor

Progressive Florida concern operates quarry, lime putty and ready mixed concrete plants, and makes various concrete products

By NEWELL CAUDELL

IN PALM BEACH, FLA., and surrounding area, Burnup & Sims is identified with practically every phase of the building supply and construction industry. With three different plants and a quarry, they are well fitted to fill these needs. The largest plant, located in West Palm Beach, manufactures ready mixed concrete, is modernly equipped and delivers about 150 cu. yd. of concrete per day. This concrete has been used in the larger building projects in the Palm Beach area, including business buildings, federal projects and suburban developments.

The lime putty plant is a recent innovation in the local building industry, and the company is pleased with its enthusiastic reception and constantly expanding volume. At this plant, colored plaster, sold under the trade name of Redi-Mix Colored Texture, is machine mixed and delivered to the job, ready for instant use. It is the second colored plaster plant of its kind in the country, the first having been installed in Miami. This texture consists of cement, lime putty and other ingredients, formulated by a local man, is available in many shades and designs, and gives immediate and permanent color to walls at no appreciable cost over the old method.

Burnup & Sims also manufactures single, double and triple size concrete brick at their Dun-Brik plant. This unit of their business puts out approximately 6500 brick a day.

But the quarry, on Peanut Island, is really the most interesting part of the business. Located close to the Palm Beach Inlet, this little island's strategic position caused it to be used for a Coast Guard Station. Burnup & Sims' quarry and machinery take up a good deal of the rest of the island, and they maintain a fleet of barges to transport materials to the mainland. At the quarry, the material is crushed, washed and graded into aggregate for concrete and plaster and is said to be the only material in this locality that will meet the Federal and A.S.T.M. specifications. In the past year, 50,000 cu. yd. of material were taken from the Peanut Island quarry.

Since very few people have the opportunity of visiting Peanut Island, and to better acquaint the public with their new lime putty plant, the Burnup & Sims Co., recently had a display placed in the Florida Bank & Trust Co. This display, as shown in the illustration, consisted mainly of pictures of various plants and equipment. Photographs were printed on transparent paper, with a light behind each of them. Concrete block and other materials, both raw and manufactured, were included in the display. Incidentally, Burnup & Sims have a letter from the bank, telling of the favorable comments heard about the display, the local newspapers gave it a nice write-up, old customers voiced congratulations, and there were many new inquiries. It was a very fine bit of advertising, and might be used to advantage in other localities.

Bomb-proof Shelters

INVENTION of bomb-proof shelters is not confined alone to those countries now at war or close to the carnage, but is also active in this country. Stephen Stepanian, vice-president of The Arrow Sand & Gravel Co., Columbus, Ohio, has invented a bomb-proof shelter which may be built at relatively low cost and in a minimum time.

The ground is first excavated to the required shape of arches and footings by excavators, graders, rollers, etc. Concrete is then placed in a manner similar to paving operations, with the necessary reinforcing irons forming the footings and arches. No forms whatever are required. When the concrete has cured sufficiently, mechanical shovels are used to excavate under the concrete arches, and dump trucks and road scrapers place the excavated material on top of the arch sections previously poured. The final operation consists in paving the floors of the bomb-proof shelter with reinforced concrete to form floors and also to act as tension members for the end arches. A typical design calls for an interior height of 36 ft. from the center of the shelter floor to the highest point in the arched ceiling with a floor width of 160 ft.

New Pipe Plant

UNION CONCRETE PIPE CO., Parker, Wash., is building a new $20,000 concrete pipe plant at Sunnyside, Wash. New equipment is housed in a 30- x 80-ft. building and has about the same capacity as the Parker plant. Joseph Ban is president of the company.

Left: Ready mixed concrete plant with block plant to the left. Center: Illuminated display of company's products. Right: Crushing and screening plant at quarry on Peanut Island

Cast Masonry Units in

Raising a group of concrete units out of the production line for stockpiling

MASS PRODUCTION principles and the application of heat by radiation rather than steam vapor for curing concrete poured into molds are distinctive processes employed in manufacturing concrete products at The Cemenstone Co.'s new plant on Neville Island, Pittsburgh, Penn.

The Cemenstone Co. started in 1939 as a licensing organization to grant franchises to approved concerns for the manufacture of "Cemenstone," but now it has gone actively into the manufacture and sale of these units. Manufacturing equipment of the original licensee, the D. J. Kennedy Co. of Pittsburgh, was taken over and an entirely new plant is now in full production. Methods of manufacture have been further perfected since the earlier plant was described in ROCK PRODUCTS, May, 1939, p. 63.

The new plant consists of a stationary mold assembly line running the length of the building, a self-propelled concrete mixer having a travel in either direction over the production line from a central station where it is charged, overhead hoisting equipment for handling units out of the molds, accurate batching equipment and a 70- x 140-ft. storage area under cover.

Floor slabs, roof slabs, concrete masonry units, curbs, sills, lintels, coping, areaways—all of original design—are the products thus far manufactured. Making other contemplated units will be just a matter of fitting the required steel molds into the production line.

"Cemenstone" slabs are the principal product made so far, and they are being shipped by truck or rail. They are designed in 5-ft. lengths and fractions thereof, with a standard width of 12 in. A 9-in. width is also available. Both floor and roof slabs are channel-shaped, with a 1½-in. web thickness, to eliminate surplus dead weight.

Floor slabs are reinforced with a metal fabric mat welded to primary reinforcing rods embedded in the legs of the slab, and the edges are designed for grouting.

These slabs are said to be especially suitable for other uses such as for veneering, steps, belt courses, copings and for sidewalks around houses and industrial plants.

"Cemenstone" masonry units, which are made to prevailing standard dimensions based on the 8- x 8- x 16-in. or 8- x 12- x 16-in. units and fractions, are designed with square ends to provide deeper vertical joints and a wider mortar bed on top. Some of them have slots provided at one end for the insertion of steel sash.

Batching and Mixing

Batching of materials is done at one side of the building so that the mixer is charged at the midpoint of the assembly line. The mixer's travel is in either direction over the molds from the batching floor in order to stagger the operations of pouring and curing.

Aggregates are either pea or shot gravel and a river sand which can be handled at the plant by truck or rail. A track hopper feeds into a bucket elevator that fills a 100-ton, 3-compartment Blaw-Knox steel bin. The third compartment is a reserve for special aggregate.

Aggregates are weighed out into a Blaw-Knox batcher overhead, but the operator has his controls, including a 3-beam scale, on the level of the mixer charging floor, discharge being directly into the mixer through an inclined steel chute. Water is measured into the mixer on a gallonage basis by a meter manufactured by the Pittsburgh Equitable Meter Co.

High early strength portland cement is a time saver in this operation where early stripping is necessary. About 30 minutes is saved by its use in the total time elapsed from the time of pouring to the time of stripping. Cement is received in sacks which are emptied on to a short belt conveyor which discharges into the mixer.

Left: Modern concrete products plant where mass production method is used. Batching and storage bins on right

Below: Stockpile of concrete slabs and block, all under cover. Note wooden sleds for handling with carloader

Long Mold

Thirty-two concrete slabs are made in one cycle on steel mold which is vibrated when mix is poured. Heat is applied by steam radiation coils in cores

Production line for all types of concrete units, showing mixer and charging equipment to the right of center. Note cover to the upper left which is let down over molds during application of heat

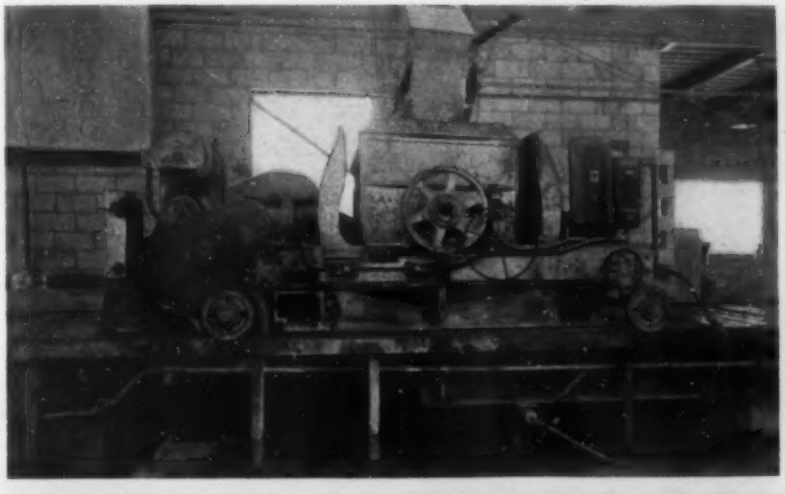
Mixing is done in a 2½-cu. yd. concrete mixer which is self-propelled by a 1½-hp. electric motor on rails spaced 6 ft. 3 in. apart and spanning the mold assembly line for its entire length. The mixer is driven by a 12-hp. motor. A single batch is enough to pour one-half the length of the line, when the mixer returns for another batch and a trip in the opposite direction. While pouring one-half the line, units in the other end are being cured and the operations are repeated.

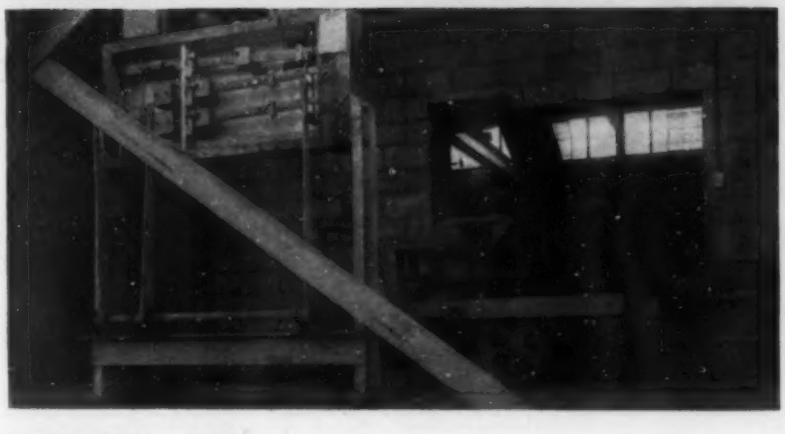
This principle of manufacture is based on the use of a rich plastic mix, with a mix proportion of 1:2:4 in order to produce a dense concrete. Curing has to be accelerated in order to release molds on one-half the line in time for a repeat pour when the mixer has poured the other half.

Four Frames of Molds in Production Line

The production line consists of four frames of molds, two on each side of the mixer charging point. Ordinarily two frames are set aside for slab manufacture and the other two for concrete masonry units and other products. Molds are assembled in each frame so that they are supported by cross sills which are lifted out when stripping. A special pickup device, illustrated herewith, lifts out alternate sills and a 3½-ton crane carries the units any place desired within the building where the stripping operation is completed. The cores remain in place within the frame. Slabs are cast on edge. Sixty-four 8- x 8- x 16-in. units are manufactured to a cycle which is the equivalent of 80 units counting fractions, and 32 slabs are made in one pour.

Mixing and charging equipment. Top view: charging the concrete mixer which is self-propelled on rails over the concrete molds. Bottom view: Aggregate scales and equipment for charging the mixer in the background





This plant has no curing kilns but does most of its curing by the application of heat to the mold during and after the pour, followed by a 7-day curing period under cover. All the cores are hollow and the entire supporting structure, side plates and molds are hollowed out. A 75-hp. boiler develops steam to 15 p.s.i. which is forced through piping into these various hollowed out areas to transmit heat to the concrete. Steel thicknesses are ¼-in. and ⅜-in. plate which enable a quick buildup of heat and temperatures up to 180 deg. F. are developed inside the frame. Condensate drops into a drain pit under the assembly line. Each frame is coil-mounted and fitted with Electric Tamper and Equipment Co. electric vibrators which are started by push buttons.

Operating Procedure

Operating procedure is comparatively simple. After the concrete is mixed, the mixer is set in motion on its wheels at the rate of 35 to 40 ft. of travel per minute over the molds. The mixer car is fitted with screeds at each end, the mixer being tilted to pour out the desired amount of concrete be-

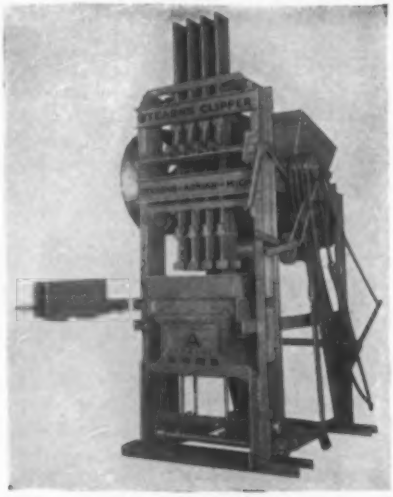
INFRINGEMENT NOTICE

To Builders and Users of Block Machines

Please take notice that the Stearns Manufacturing Company of Adrian, Michigan, are the sole and exclusive licensees of "Jolterete" vibration block machine patents and patent rights and have the sole and exclusive right to manufacture and sell such equipment.

At the present time there is a suit for patent infringement pending against a New York concrete products plant (name given upon request), a user of infringing equipment. Others manufacturing infringing equipment and the users of such equipment will be prosecuted to the fullest extent of the law.

Louis Gelbman, Inventor
Suite 2001, 350 Madison Ave., New York, N. Y.



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Geo. S. Mepham Corp., East St. Louis, Ill.
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tween the screeds, which level and trowel off the top surface as the car moves.

Heat is applied within the cores and molds as pouring progresses and the vibrators are started up. Their frequency is 7000 r.p.m. At the end of the production line, any excess of concrete is caught in a box on wheels and used to make concrete specials.

The mixer then returns for another batch and a cover is let down over the freshly poured concrete to hold in the heat. After the initial set, bond is broken between the various sills by raising them slightly by jack screws and stripping is done 15 minutes later.

Trucks Handle Units Piled on Sleds

Stripped units are piled on wood sleds, or pallets, and are handled within the plant and onto trucks to destination on these pallets, using a Clark gasoline "Carloader" for handling. This machine slides prongs beneath the pallets, as illustrated, and is capable of piling units a height of 10 ft. in stockpiling. In the same way they are taken from stock and loaded on to flat-bed company-owned International trucks for delivery.

L. M. Johnston is president of The Cemenstone Co.; W. P. Withrow, Jr., is secretary-treasurer; Frank Sloan is sales engineer; Albert Henderson is consulting engineer, and C. E. Gross is manager of the plant.

Showing how masonry units are transported and stockpiled on sleds with gasoline carloader unit

Handling concrete block from stock on to flat bed truck for shipment

New Cinder Block Firm

ACME FIREPROOF BLOCK CO., Lima, Ohio, is the name of a new company which has located its plant at North Union street and the Baltimore & Ohio railroad tracks. S. C. Wolfe, Cridersville, is president; A. C. Harold, Lima, is vice-president and treasurer; and R. A. Lindemann, Delphos, is secretary. Mr. Harold announced that equipment to manufacture the block had been purchased, and it was expected operations would start late in September. The plant will have a capacity of 30,000 standard size block per month.

Concrete Brick

GRIFFIN AND SLAYMAKER, Iowa City, Iowa, has gone into the manufacture of concrete brick. The firm has installed a Dunbrik machine, uses sand and gravel aggregates, and is equipped to make brick in an assortment of colors.

Buy Block Machinery

WALLA WALLA CONCRETE PIPE CO., Walla Walla, Wash., is manufacturing concrete block and other concrete masonry, having recently installed a tamp block machine and power mixer. Local glacial deposits of sand and gravel are the source of supply for aggregates.

•

H. A. PRASCHAK, Marshfield, Wis., has purchased concrete block machinery and property in Marshfield where he intends to build a new plant.

Demand for Pipe Requires Expansion

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, continues to be America's fastest growing manufacturer of concrete pipe. The company has some 20 plants principally in the east and middle west, newest of which is one just completed at Worcester, Mass. This plant will employ 30 to 35 men, and represents an investment of $50,000. Fifteen acres of land were purchased together with a frame building, and the entire property has been reconstructed to suit the needs for making pipe. H. Eschenbrenner is president of the company and S. Keith Seeds has been transferred from Syracuse, N. Y., to manage the plant.

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COLUMBIA CONCRETE PIPE CO., Wenatchee, Wash., has acquired seven acres of property in Okanorth Acres, Okanogan, Wash., as a site for construction of a new concrete pipe plant. A deposit of gravel was included in the purchase, which will be excavated and washed for aggregates. The company has operated a successful business in Wenatchee for many years. A. B. Metcalf is manager.

•

CONCRETE PRODUCTS CO. OF AMERICA, Philadelphia, Penn., has under construction at Montoursville, Penn., a new plant to manufacture poured large concrete pipe and machine-made pipe. The plant will turn out pipe of 12- to 84-in. diameters. H. L. Hamrick is superintendent of the new plant.

To Make Haydite In Washington

WASHINGTON Haydite and Concrete Products Co., Bothell, Wash., has purchased the properties of the old Bothell Brick and Tile Co., and is planning to manufacture Haydite under license from the American Aggregates Co., Kansas City, Mo. This is a new company headed by J. L. Warner. Much of the old brick equipment will be used, but a large rotary kiln and other new equipment will be purchased. Haydite is a product made by expansively burning certain types of clay or shale in a rotary kiln, and is used extensively as a lightweight concrete aggregate. Officers of the company are as follows: J. L. Warner, president; E. L. Warner, vice-president; F. J. Wettrick, secretary; and D. C. Knapp, treasurer.

JAEGER "HIGH DUMP" TRUCK MIXERS

Solve Your Placing Problems

FASTEST LOADING, FASTEST MIXING AND FASTEST HIGH DISCHARGING TRUCK MIXER ON THE MARKET . . .

NEW DRUM SIZES BOOST PAYLOAD

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2, 3, 4 Cu. Yd. Sizes. 2 Yd. Size Mounts on Short Wheelbase Ford-Type Trucks

Also STANDARD HEAVY DUTY MIXERS up to 5½ Cu. Yds. (7½ Cu. Yd. Agitators)

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- Pressing
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Write for Information

KENT-ROOT VIBRA-PRESS

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

Left: One of the 3½ cu. yd. Rex transit mixers on Ford trucks with Warford four-wheel drive

Right: Heltzel Batching plant for ready-mixed concrete installed early in 1939

A Versatile Plant

WARREN SAND AND STONE CO., INC., Carpentersville, N. J., producer of sand and gravel and crushed dolomite, has added the production of ready-mixed concrete during the past year. Equipment comprises a Heltzel batching plant with storage capacity of 220 tons in four compartments, Kron scale and two 3½-cu. yd. Rex transit mixers mounted on 10-wheel Ford trucks. The Fords are equipped with Warford 4-wheel drives.

The aggregates plant is unusual in that both sand and gravel and crushed dolomite are produced through the same plant. Production of each is, of course, a separate operation, but the same equipment is used for both and all screening is done wet. Sand and gravel is excavated from a pit and dolomite from a ledge, both deposits being a one-quarter mile truck haul from the plant.

Crushing equipment consists of a 24- x 36-in. jaw crusher and two No. 37 Kennedy gyratory reduction crushers, with revolving screens and a vibrating screen for grading. The stone ledge is drilled with jackhammers. Capacities are 1200 tons of sand and gravel in 8 hr. or 400 tons of crushed stone in the same time.

New Truck Mixer Fleet

MAKINS SAND AND GRAVEL CO., Oklahoma City, Okla., has replaced a part of its fleet of nine truck mixers with five new 1½-cu. yd. Jaeger concrete mixers on V-8 Mercury chasses. The older truck mixers were of larger size.

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NEW ALBANY READY MIX CONCRETE, INC., New Albany, Ind., is erecting a ready-mixed concrete plant at Jeffersonville, Ind., which is to be managed by S. D. Zenor. The company operates plants at New Albany and Tell City, and is producing concrete for flood walls now under construction from both locations.

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Permanent equipment—We do not know of a Presteel Pallet customer replacing with any other type.

Light and easy to handle and store.

Makes a firm anvil for tamping—pressed cold in dies—uniform—recommended by block machine makers—ask us or your machine maker.

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Consultation Service

In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

ROCK PRODUCTS
309 West Jackson Blvd. Chicago, Ill.

SURE CONCRETE BRICK CAN BE MADE WITHOUT PALLETS ON THE

JACKSON CONCRETE BRICK MACHINE

Just Think What This Means in Dollars and cents saved in handling and upkeep as well as the cost of the pallets themselves.

Investigate today the most efficient and up to date concrete brick making equipment on the market.

JACKSON & CHURCH CO.
SAGINAW, MICH.

TWO articles in this issue are further proof that ROCK PRODUCTS is still first with the best in the Sand and Gravel Industry. These are the descriptions of the Crystal Concrete Corporation and the Grandview plant of the American Aggregates Corporation plants which have only recently been completed. Both articles were written by the engineers who designed the plants—proof that ROCK PRODUCTS also seeks the best from within this industry.

Briefly—this is why we are calling your special attention to these two articles. The type of problems which are solved by various features of these plants are the same that face many of you every day.

Much more emphasis is now being placed on storage facilities in modern sand and gravel plants, and equipment for blending a number of sizes to meet the exacting specification requirements. Typical of this trend is the new Columbus, Ohio, plant of the American Aggregates Co. Although the plant has only 200 tons per hour production capacity, it has bin compartments for three sizes of round gravel, four sizes of crushed gravel and three for sand or nearly ten times the production capacity. A long tunnel conveyor beneath the bins with 24 bin gates permits blending of any desired specification of material. Convenient storage yard railroad trackage is arranged to allow for even larger surplus ground storage. Diesel locomotives are used for switching loaded and empty cars.

Additional crushing capacity has helped to relieve conveyor loading at the new sand and gravel plant of Crystal Concrete Corp., Braintree, Mass. The new deposit had a considerable percentage of boulders which could not be safely or efficiently handled on the conveyors leading to the main screening plant. A gyratory crusher handles all plus 5-in. material and plus 12-in. boulders are rejected on a bar grizzly. The scalping screen is also relieved from the burden of handling all large stone. Three sand classifying tanks recover the fines which are so essential in meeting present specifications.

In This Issue

NEARLY 100 YEARS YOUNG AND STILL GROWING

When a business is conducted successfully for nearly 100 years, it has demonstrated that it is performing a real service. In less than six years, The Casper Stolle Quarry & Construction Co. will celebrate its centennial with the sons of the original founder continuing to manage the business. Expansion and modernization have been the foundation of this company's success in the crushed stone business. Everyone in the industry should be interested in the story of this company's methods of operation and equipment which have kept it abreast of the times.

SAMPLING—A NEW SERIES FOR THE CEMENT INDUSTRY

Sampling clinker and portland cement has become a real problem with the increasing demands for new cements and more stringent laws and regulations governing cement purchases by public authorities. The first article describing specific methods and equipment used by cement companies appears in this issue under the title of "Sampling Devices for Processing Portland Cement."

MANY IDEAS FROM NEW CRUSHED STONE PLANT

When the steel mills are humming with activity, the flux stone plants of the United States are doing a booming business. A new flux plant in Pennsylvania, having some interesting features, was recently completed in time to meet the increasing demands from the steel industry. To speed up operations, Diesel trucks of large capacity are used. Automatic, recording weighing equipment of each load before it is dumped, and an interesting arrangement of crushers are other features of this plant.

CONCRETE PRODUCTS BY MASS PRODUCTION

Mass production methods which have been made notable by the automobile industry are being employed for perhaps the first time in the production of concrete products of all types by The Cemenstone Co., Pittsburgh, Penn. A brand new plant has been erected and is now in operation. The unusual method of curing by steam radiation while the long steel mold holding concrete is being vibrated should be of interest to every concrete products producer.

Rock Products
309 WEST JACKSON BLVD.
CHICAGO, ILL.

NEW MACHINERY * NEW EQUIPMENT

Gravity Discharge From Pulverizers

THE BABCOCK & WILCOX CO., New York, N. Y., has made an important improvement in the design of the pulverizers used in its closed-circuit system for grinding raw material and clinker.

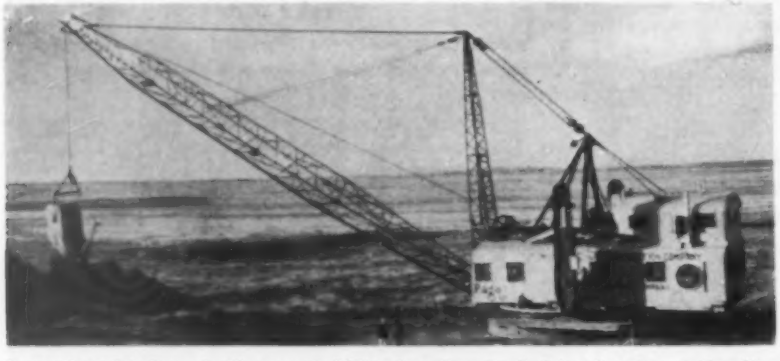
It consists of a gravity discharge from the grinding zone, located centrally in the pulverizer base and having the proper angle necessary for a free discharge of the material directly into the elevator which handles the circulating load.

The change eliminates the use of a discharge sweep, resulting in a reduction of power consumed by the pulverizer, and lower maintenance costs. The new gravity discharge simplifies the pulverizer and makes it more compact. It will be made standard on all sizes of Babcock & Wilcox pulverizers arranged to operate in closed circuit. Existing installations can be changed to the new design.

Walking Dragline With Two Diesels

PAGE ENGINEERING CO., Chicago, Ill., has developed a two-engine, Diesel-powered walking dragline with a fast hoist and swing. It is said that this combination has very appreciably stepped up the capacity.

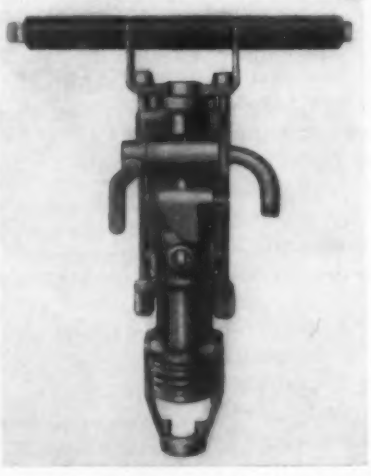
With this dragline one Diesel engine operates the hoist and a second independent Diesel operates the swing. The two engines, the large Diesel which only hoists and loads the bucket, and the smaller independent Diesel for swinging as rapidly as the faster hoist demands, provides balanced power and increases the number of loaded buckets that can be handled per minute.



Separate and independently operated Diesel engines for hoist and swing on dragline

Light Sinking Drill

GARDNER-DENVER CO., Quincy, Ill., has developed a light sinking drill, known as the S-33, which weighs 31 lb. and is said to be particularly adaptable for close quarter work. It



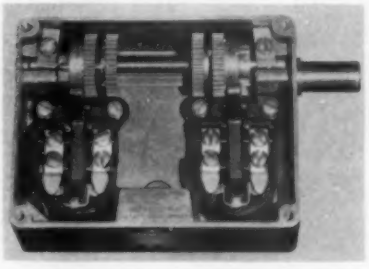
High speed drill for close quarters

may be easily had in any position for chute blasting and hitch-cutting.

Its power and speed are largely due to the four-pawl rotation instead of the two-pawl generally used. The pawls are reversible for double wear and a special spring eliminates the necessity of pawl plungers. The exhaust control valve when closed diverts live air at full line pressure to clean the bottom of the hole.

Limit Switch Controls Rotating Shafts

GENERAL ELECTRIC CO., Schenectady, N. Y., has developed a small-size geared-type limit switch for application on motor-driven devices where



Geared-type limit switch

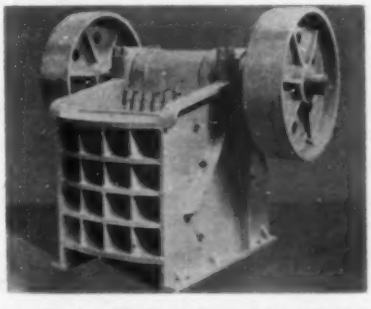
it is necessary to limit the rotation of the motor shaft or some rotating shaft or gear on the driven machine.

In use, the shaft of the switch (which is usually directly connected to an electric motor) serves as a driving gear, causing the pinion shaft to turn.

At the end of travel in either direction, a pin on the traveling gear engages a pin on the operating gear. This causes the operating gear, cam, and safety pin, which are a unit, to rotate and move the switch contact arm to a high part of the cam, operating the contacts. These contacts are designed for 125-volt, 4-amp., a.-c. operation and 125-volt, 1-amp., d.-c. operation.

Jaw Crushers Make More Uniform Product

DIAMOND IRON WORKS, INC., Minneapolis, Minn., has brought out two jaw crushers in sizes 20- x 36-in., and



Crushers with long jaws to produce a more uniform product

24- x 38-in. These units have a long jaw design and contour of breaker plates which, it is claimed, assure more positive grip and crushing effect on the upper or feed end of the jaws. The long jaws produce a more uniform product by preventing larger stone and slabs from passing before reduction.

A *Ransome* TRUCK MIXER FLEET MEANS

Quality Mix—More Profit—Customer Satisfaction

Six Ransome Truck Mixers Owned by CONSERCO, INC., Washington, D. C.

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DUNELLEN, NEW JERSEY

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We are in the market for and would like to receive prices and literature on the items checked below:
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- Air Filters
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- Asphalt Mixing Plants
- Batching Plants
- Bags
- Bagging Machines
- Balls (Grinding)
- Barges
- Batchers (Weighing)
- Bearings
- Belt Repair Equipt.
- Belting (Conveyor & Elevator)
- Bin Level Indicators
- Bins (Storage)
- Blasting Supplies
- Block Machines, Building
- Boats
- Brick Machines & Molds
- Buckets
- Building Tile Machines
- Bulk Cement Batching Plants
- Bulk Cement Storage Plants
- Bulldozers
- Bullscrapers
- Burial Vault Forms
- Calcining Equipment
- Calcium Chloride
- Carbon Dioxide Plants
- Cars (Industrial)
- Catch Basin Block Machines
- Cement Colors
- Cement Process
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- Chimney Block Mach. & Molds
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- Classifiers
- Coal Pulverizing Equipment
- Concentrators
- Concrete Mixers
- Concrete Paints & Coatings
- Concrete Waterproofing & Dampproofing
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- Conveyor Idlers and Rolls
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- Curb Forms
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- Drain Tile Machines
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- Drill Sharpening Machines
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- Floor Tile Machines
- Flotation Equipment
- Garbage Receptacle Molds (Concrete)
- Garden Furniture Molds (Concrete)
- Generators & M-G Sets
- Guns (Hydraulic)
- Gutter Block Machines (Concrete)
- Hoists
- Hoppers
- Hose
- Hydrators (Lime)
- Induced Draft Fans
- Joist & Slab Machines (Concrete)
- Kilns (Rotary, Shaft, Vertical)
- Laboratory Apparatus
- Lift Trucks
- Lime (Hydrated)
- Lime Handling Equip.
- Lime Plants
- Lime Putty Plants
- Loaders
- Locomotives
- Lubricants
- Manganese Steel Parts
- Mills (Ball, Compartment, Emery, Hammer, Rod, Roll, Tube)
- Mortar Mixers
- Pallets (Steel, Wood)
- Pans, Grinding (Wet & Dry)
- Perforated Metal
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- Pneumatic Hammers
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- Pumps (Pulverized Material)
- Railway Equipment
- Rectifiers
- Recuperators
- Refractories
- Rewashers (Screw)
- Rock Wool Cupolas
- Roofing Tile Machines
- Sand Dragg
- Sand & Gravel Plants
- Sand Lime Brick Machinery
- Sand Settling Tanks
- Scales
- Scrapers (Power Drag)
- Screens (Revolving, Vibrating, Etc.)
- Seal Rings
- Septic Tank Molds
- Sewer Pipe Machines
- Shovels (Power)
- Silos (Storage)
- Silo Stave Machines
- Slakers (Rotary)
- Slurry Mixers
- Slurry Pumps
- Slurry Separators
- Slurry Thickeners
- Soft Stone Eliminators
- Speed Reducers
- Structural Steel Fabrication
- Tampers (Hand & Power)
- Tanks (Storage)
- Tires
- Tractors
- Transit Mixers
- Trucks (Agitator)
- Trucks (Dump)
- Trucks (Industrial)
- Trucks (Mixer Body)
- Unloaders
- Unloaders (Boat)
- Unloaders (Box Car)
- V-Belting
- Vibrators (Bin)
- Wagons (Dump)
- Wall Forms & Machines (Concrete)
- Washers (Sand, Gravel & Stone)
- Welding & Cutting Equipt.
- Well Curbing Mach. & Molds
- Wire Cloth
- Wire (Copper, Iron & Steel)
- Wire Rope
- Wire Rope Fittings

City _____

Individual _____ *Title* _____

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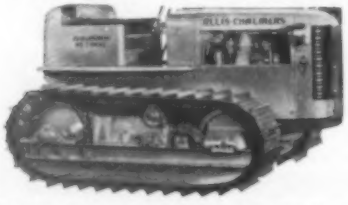
Firm Name _____ *State* _____

NEW MACHINERY

Less Horsepower in Diesel Tractor

ALLIS-CHALMERS MFG. CO., Milwaukee, Wis., has announced the model HD 7 tractor powered with a 2-cycle, 54-hp. General Motors Diesel engine. Two other models, the 79-hp. HD 10 and the 108-hp. HD 14, completes the line of similarly equipped tractors.

In addition to low fuel consumption and smooth operation claimed for this tractor, the HD 7 has Velvetouch bimetallic clutches and brakes, positive seal truck wheels and idlers, and a track release spring mechanism which reduces wear on tracks and prevents unnecessary strain on other



Diesel tractor equipped with track release spring mechanism which reduces wear on tracks

tractor parts. The 54-hp. tractor weighs approximately 13,000 lb. in the 63-in. tread model.

Equipment suitable for use with this model includes: 5-cu. yd., two or four-wheel scrapers, 8 to 10-ft. blade graders, 7-cu. yd. wagons, bulldozers, angledozers and others.

Increase Truck Mixer Payload

THE JAEGER MACHINE CO., Columbus, Ohio, has announced a series of new drum sizes for its truck mixers which increase the payload. Ample void space also is available with the increase in capacity.

In the illustration is shown a 2-cu. yd. unit which replaces the former 1½-cu. yd. size. The other four sizes

Truck mixer with larger drum to increase the payload

High speed scraper unit of smaller capacity

are as follows: 3 cu. yd., replacing the 2½ cu. yd.; 4 cu. yd., replacing the 3½ cu. yd.; 5 cu. yd., replacing the 4 cu. yd., and the 5½ cu. yd. which remains unchanged. It is said that the compactness of the mixers is such that the 2 cu. yd. size with the 104-cu. ft. drum may be easily mounted on short wheelbase, Ford type trucks.

The mixers will continue to have the vacuum-controlled truck engine drive operated from the cab, an accessible water control panel for mix, tempering and flush valves, the Sypho-meter water tank, and other features.

Smaller Scraper Unit for Stripping

R. G. LE TOURNEAU, INC., Peoria, Ill., has developed a smaller type Tournapull, known as Model C., for long haul dirt moving. Powered by a "Caterpillar" 4 cycle, 6 cyl., D-468 Diesel engine, it has a top speed of 13 to 15 miles per hour, depending upon tire equipment. At 1800 r.p.m. it develops a maximum brake horsepower of 90.

To give the greatest possible traction per pound of weight, the entire weight of the engine and half of the weight of Carryall scraper and its load are placed on the two large pneumatic tired drive wheels by the elimination of front wheels. Mate to the Model C Tournapull is the Model LS Carryall scraper with a struck capacity of 8.2 cu. yd. and a heaped capacity of 11 cu. yd. This combination is a self-loading unit, but for maximum efficiency, pusher loading is recommended.

Shovel with Controls Sensitive to Load

LINK-BELT SPEEDER CORP., Chicago, Ill., has brought out a 1 to 1¼-cu. yd. shovel convertible to dragline or crane service known as the Model LS-100.

Convertible shovel which is of welded steel design

The machine is controlled by "easy-throw" levers and is equipped with a type of clutch and booster system that is said to give the "feel" of the load at all times.

Other features include: fully enclosed travel brakes controlled from the cab; enclosed traction gears running in oil; a 72-in. diameter roller-path turntable with patented, self-aligning rollers; free floating center-pin bearings; and either a gasoline or Diesel engine. Track shoes are 24-in. standard with 30-in. optional.

Alloy for Heavy Duty Gears and Shafts

JOSEPH T. RYERSON & SON, INC., Chicago, Ill., has announced that a stock is being kept of S.A.E. 4815, a carburizing nickel-molybdenum steel for heavy duty gear and shafting applications. The steel has been recommended for gears, pinions, spindles, splined transmission shafts, pins, stressed parts of trucks, tractors, pneumatic and machine tools, and drilling equipment. It is carried in stock from ½-in. to 6-in., inclusive.

Convincing User of Ready-Mix On Yardage of Concrete

In the discussion of a paper on the Warner Co.'s ready-mixed concrete business in Philadelphia, at the 1940 convention of the American Concrete Institute, the question was asked how the company settled controversies with customers on the actual amount of concrete delivered. Herbert J. Whitten, of the Warner Co., gave the following answer:

"I think every producer of ready-mixed concrete is constantly faced with that problem. Our company, over the last 18 or 19 years, has had frequent controversies regarding the quantity of concrete supplied. I am glad to say that there appears to be less and less of that sort of argument. Immediately upon receipt of such a complaint, we send to the site of the work an experienced construction field man who is on our staff, to check the measurement of the concrete in place. It is quite surprising how very often we are able to settle those controversies by the simple expedient of taking exact measurements and convincing the complainant that he is in error.

"Some years ago we had what I think was the most serious complaint regarding the quantity of concrete furnished on a fairly large job where we had rather expected such a complaint, because we knew of careless practices in placing the concrete. The operation was so large and so diversified that it would have been almost impossible to measure the entire job, involving about 20,000 cu. yd. of concrete. So we suggested to the purchaser that a certain portion of the work be cored, because we wanted to convince him that the measurements shown on the drawings for the job had not been followed in placing the concrete.

"The purchaser agreed to that, and a coring machine was placed on the job under a friendly agreement that whichever side was wrong would be obligated to pay for the cost of coring the work. So we cored the section of the work that was selected and insofar as we were concerned, were preparing to continue the coring operation, not only on that section of the job but other sections. But the results of the cores, measured after some three or four days work, showed so conclusively that the thickness was so much in excess of the designed thickness, that the complainant contractor asked the coring operations be suspended, and not only assured us that he was completely satisfied regarding the quantity of the concrete that had been delivered to him, but actually apologized to us for having raised the question in the first place.

"On occasions when users not entirely accustomed to ready-mixed concrete have discussed with us the question of yield, we like to have the contractor or his representative come to our field laboratory where we have fairly adequate facilities for running trial batches of the mix and demonstrating that the quantities employed in the mixer which are to be used on the operation actually do produce the quantities represented. By such methods there is frequently established a more satisfactory bond of confidence between the maker of the concrete and the user.

"We sell ready-mixed concrete on the cubic yard of concrete delivered. In marketing concrete we represent that we deliver one cubic yard consisting of 27 cu. ft. of fresh concrete delivered to the site of the work, and we do not assume responsibility that the concrete, after being placed in such forms as the contractor provides, will necessarily agree with the plans for that form work, because we have no control over that."

New Calcium Carbide Plant to Be Built

Washington Brick & Lime Co., Spokane, Wash., with a plant at Bay-View, Idaho, will furnish the lime for a new calcium carbide plant, costing $200,000, to be built by Pacific Carbide & Alloy Co., at Portland, Ore. Portland Gas & Coke Co. will supply the coke. Power will be supplied from Bonneville dam.

•

The Southern States Lime Corp., Crab Orchard, Tenn., has under consideration an extensive enlargement of its plant in the near future, according to a local report. It is reported that four more kilns will be built, doubling present capacity, and storage bins holding 225 tons of lime will be added.

•

The Cold Springs Quarry Co., Mellen, Mich., has ceased operations at Mellen and plans to move its equipment to St. Cloud Minn., in the near future.

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Write for new Bulletin today

Study this picture! It is a typical quarry operation with LOAD LUGGER and dump buckets . . . a continuous performance, filling the empties and hauling away the loaded ones . . . no lost time, no idle equipment.

You can cut your costs 50% or more by this modern system. It is great for supplying material to crushers, road building, government projects or handling any material where loading must be done by hand.

Brooks EQUIPMENT AND MFG. CO.

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Marquette Buys Hawkeye

MARQUETTE CEMENT MANUFACTURING Co., Chicago, Ill., has purchased the Hawkeye Portland Cement Co., Des Moines, Iowa, which operated a wet process plant with six kilns having a capacity of approximately 1,675,000 bbl. annually. An article describing the latest improvements in this plant appeared in ROCK PRODUCTS, November, 1937, p. 44. Representing the Marquette company in the sale which was consummated September 1, were: W. A. Wecker, president; Stuart Duncan, chairman of the board; Richard Moyle, vice-president; D. S. Colburn, vice-president; Frank Moyle, general superintendent; Vincent J. Hanley, secretary-treasurer; Leonard W. Saxby, assistant to the president; and John J. Kelley, industrial relations manager. The Iowa plant will be operated directly as a unit of Marquette.

It has been announced by the Marquette company that modernization plans are under consideration which will include the installation of waste heat boilers for power generation, new grinding equipment, and the quarry at Earlham, Iowa, will be equipped with modern Diesel trucks, power shovels, and locomotives. All these contemplated improvements, however, are contingent upon a report which engineers of the company will make after a careful survey.

The Hawkeye Portland Cement Co., incorporated in West Virginia will be liquidated, and a new company incorporated in Iowa but retaining the old name has been formed by Bertram E. Manley, former general manager of the old company. This company will take over the distribution of cement made by Marquette at the Iowa plant under the well-known Hawkeye brands. Mr. Manley is president of this sales organization and H. Y. Readinger will continue as secretary and treasurer.

Will Construct 3000 Miles of Defense Roads

NATIONAL DEFENSE highway construction will involve 3112 miles of access roads to cantonments and other military reservations at a cost of $212,000,000, according to John M. Carmody, administrator of the FWA.

Of the 225,000 miles in the nationwide highway system, 75,000 are included in the strategic national defense network. Based on a survey of this defense mileage, the proposed access roads to about 120 cantonments will include 1241 miles within and 1871 miles outside of military reservations. The cost of these new roads will be borne largely by the federal government.

In addition to this new construction, bad curves and grades must be improved and shoulders widened on many existing highways within the strategic network. Strengthening of 1800 bridges and the construction of new bridges also is included in the program.

Quarry Works Overtime For "National Defense"

LYNN SAND AND STONE Co. has been operating two shifts at its Swampscott, Mass., quarry. The town counsel had sought to compel the quarry to cease operation after 9 p.m., but officials refused to comply. Theodore Cooke, president of the stone company, has declared that the work is necessary for "national defense." The company employs nearly 100 workers, most of whom are residents of Swampscott. It is contended by the company that it has a backlog of orders on small stone which cannot be filled on time unless the crusher is operated day and night.

Start Up Foundry Sand Plant in Arkansas

HARDY SAND Co., Evansville, Ind., which operates plants in Illinois, Indiana, and Tennessee, recently opened another foundry sand unit at North Piggott, Ark., with Roy Wills as superintendent. Mr. Wills was formerly at the Camden, Tenn., plant. Equipment includes a 6½- x 45-ft. dryer, a Stedman pulverizer for disintegrating sand and clay; a J. C. Steele pulverizer for disintegrating clay; and a Raymond hammer mill.

Fire Destroys New Plant

WESTERN GRAVEL CORPORATION, Campbell, Calif., suffered a heavy fire loss at its new plant which had been in operation only two weeks. A conveyor, electric motor, and truck were destroyed. The plant cost $35,000. Partners in the firm are Cilieo Pandoni, James Boccardo, San Jose, Calif.; Dominick Vaceilli, Menlo Park; and Giulio Sarto, Los Altos.

New Illinois Gravel Plant in Operation

ROCK ISLAND SAND & GRAVEL Co., Rock Island, Ill., has started operating its new sand and gravel plant on the Andalusia road midway between Milan and Andalusia. This plant takes the place of the Mill street, Rock Island site which has been abandoned because the deposit ran out.

Rock Company Gets Barge Contract

BASALT ROCK Co., Napa, Calif., which has had much success in building all-welded barges or scows for its own use, has received a contract for $264,000 to build lighters for the United States Navy. A. G. Streblow, president and general manager of Basalt Rock Co., enjoys and deserves the reputation of being about the livest operator on the West Coast. When he took a contract two years ago for rip-rap, he designed a self-unloading scow to place it. (See ROCK PRODUCTS, February, 1939, p. 83). The scow was built at his rock plant under the direction of his superintendent, Louis M. Cassayre, who learned the art of welding in the U. S. Navy. Mr. Cassayre is a born engineer and constructor and has been a contributor to ROCK PRODUCTS.

New Quarry for Southern Indiana

T. J. ADKINS AND Co. is the name of a new crushed stone concern which has opened up a new quarry one mile from Jeffersonville, Ind., on the Hamburg Pike. A switch track has been constructed from the main line of the Baltimore & Ohio Railroad to the premises. It is planned to produce crushed stone aggregate, agricultural limestone, ready mixed concrete, and black top. Daily production will be about 1000 tons of crushed stone, and about 50 men will eventually be employed.

Big Highway Program for Chicago Area

THE COUNTY BOARD of Cook County recently voted for a five-year program of highway improvements which would cost $82,600,000 for 172.8 miles of superhighways all outside of Chicago and would build 49 railroad grade crossings.

Quarry Changes Hands

BELKNAP QUARRIES Co., Belknap, Ill., is now being operated by B. E. Green, who took over the property from Joe L. Green. The quarry and plant was originally known as the Southern Illinois Limestone Co., but was sold after the death of J. H. Woolcott of Harrisburg, Ill.

HAZARD LAY·SET *Preformed*

IS SAFER
LASTS LONGER
HANDLES EASIER
RESISTS KINKING
SPOOLS BETTER
RESISTS ROTATING
GIVES GREATER
DOLLAR VALUE

● The seven points at the left make a big statement, but every word is *true*. In fact, there are other important merits about Hazard LAY-SET Preformed that we haven't space to mention here.

Hazard LAY-SET is put through a scientifically calculated preforming process at the mill. This process eliminates the internal strain present in non-preformed rope. This relief from stresses makes LAY-SET a rope that is relaxed and willing to work. Every wire has amazing resistance to bending fatigue (and therefore lasts longer). Being flexible and limber, LAY-SET is easy to handle. Broken crown wires do not wicker out to jab workmen's hands. These are some of the other qualities which make Hazard LAY-SET Preformed the wire rope of greater dollar value, as operators now using LAY-SET Preformed will tell you.

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GREEN SIGNIFIES SAFETY

LAY·SET *Preformed* WIRE ROPE

Penn-Dixie Wins 1000-Day Safety Award

THE PENNSYLVANIA-DIXIE CEMENT CORP., New York, N. Y., recently celebrated an unusual safety record at its Clinchfield, Ga., plant when it was announced that this unit had operated 1000 consecutive days without a lost-time accident. The safety trophy of the Portland Cement Association was recently presented by H. D. Humphries, district engineer for the Association, to H. C. Armstrong, mill foreman at the Clinchfield No. 2 plant. J. Norvig, general superintendent of Penn-Dixie, was the speaker of the day. Mayor Sam Nunn of Perry, Ga., was present to congratulate the company, and E. P. Newhard, superintendent of the plant, read a telegram of congratulation from President John A. Miller.

Phosphate Conference at Ogden, Utah

THE NATIONAL PHOSPHATE CONFERENCE recently held meetings at Ogden, Utah, to discuss the possibilities of developing the huge phosphate beds of Idaho, Utah, Wyoming and Montana. Representatives of the land grant colleges, mining, and agriculture attended the meetings. Dr. Peterson, chairman of the meeting, expressed the view that the dust bowl problem was in large measure due to phosphate deficiency. It is estimated that the 18 million acres of irrigated soil in the west requires 450,000 tons annually of concentrated superphosphate. The current consumption is 60,000 tons. About 4,000,000 tons are required annually in the Middle West.

Cement Exports Increasing

THE BUREAU of Foreign and Domestic Commerce reports a very substantial increase in exports of hydraulic cements for the first six months of 1940. Exports for the first six months this year were $1,112,367 as compared with $777,436 for the same period in 1939. Imports were less than half those of the first six months in 1939. The value for the first half of 1940 amounted to $414,007 as compared with $950,741 in the same period of 1939.

Big Contract for Rip-Rap

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY has advertised for bids to supply rock slope protection on the Pinopolis dams and dikes of the Santee-Cooper project. The bids will be opened October 8 at Charleston, S. C. A total of 1,130,000 cu. yd. of rock is involved.

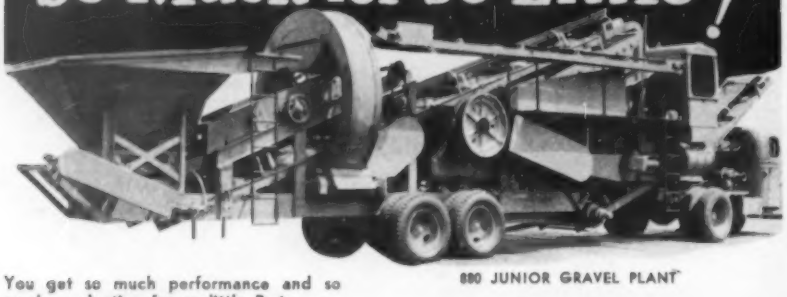
Pittsburgh Accepts Gravel for Concrete Roads

AFTER a seven-year period in which the City of Pittsburgh had virtually prohibited the use of gravel for coarse aggregate in concrete, the bars have now been let down with the acceptance of this material for use on the new Water street wharf improvements. Ray V. Warren, Western Pennsylvania Sand and Gravel Association, recently announced that contractors now may submit bids based on the use of either crushed stone, crushed gravel or plain gravel.

To combat any claim that gravel was not as satisfactory as crushed stone for concrete aggregate, the association engaged two experts to make a survey of roads in western Pennsylvania. These men, Harold Clemmer, engineer of materials for the District of Columbia, and Nathan L. Smith, consulting engineer of the Maryland State Roads Commission, inspected the roads and reported as follows:

"Our inspection of the one-course portland cement concrete roads in the vicinity of Pittsburgh, constructed with gravel from the Allegheny and Ohio rivers, leads us to the conclusion that properly processed gravel from those sources are good quality coarse aggregates for concrete pavements."

So Much for so Little!



880 JUNIOR GRAVEL PLANT

You get so much performance and so much production for so little first, operating and maintenance cost when you choose a Universal Portable Plant. You get so much equipment for so few cubic feet of space and so much capacity for so little weight. No wonder there's such a big swing to Universal Profit-Proved Crushing Equipment.

It will pay you to check up on the new thrifty all-welded steel, space saving, legal load Universal Portable Gravel and Quarry Plants.

Write today—be in line for National Defense Road Building and Maintenance Programs.

THE NEW PACEMAKER QUARRY PLANT

UNIVERSAL CRUSHER COMPANY
617 C AVE. WEST, CEDAR RAPIDS, IOWA

UNIVERSAL

Open New Quarries To Make Agstone

LIMERICK LAND LIME CO., New Limerick, Maine, has been formed to produce agricultural limestone. Eben Lake is in charge. Nearly 100 years ago lime kilns were built near the site of the present operations.

•

SCREVEN LIME CO. expects to start operations on October 15 at a plant to be opened six miles from Sylvania, Ga., on Beaver Dam Creek. P. W. Stokes and Henry A. Mosses of Florence, S. C., are the owners. Agricultural limestone will be ground.

•

ROY KEENE has leased the Morris quarry near Cheney, Wash., and will employ several men when the machinery is in operation.

TVA Cement Contract

THREE Tennessee cement companies were awarded contracts for cement by the Tennessee Valley Authority. Volunteer Portland Cement Co., Knoxville, obtained an order for $785,059; Signal Mountain Portland Cement Co., Chattanooga, $227,417; and Pennsylvania-Dixie Cement Corp., with plants at Richard City and Kingsport, $530,641.

Cement Production Going Up

BUREAU OF MINES reports that the portland cement industry in August, 1940, produced 12,719,000 bbl., shipped 13,952,000 bbl. from the mills, and had in stock at the end of the month 21,522,000 bbl. Production and shipments of portland cement in August, 1940, showed increases of 2.8 and 4.1 percent, respectively, as compared with August, 1939. Portland cement stocks at mills were 0.9 percent higher than a year ago. All plants reported for August.

In the following statement of relation of production to capacity, the total output of finished cement is compared with the estimated capacity of 160 plants at the close of August, 1940, and of 162 plants at the close of August, 1939.

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	August 1939	August 1940	July 1940	June 1940	May 1940
The month	56.5	57.9	56.0	58.9	58.0
12 months	45.5	48.0	47.9	48.2	48.1

Sand-Lime Brick Production and Shipments

NINE active sand-lime brick plants reporting for August and eight reporting for July, statistics for which were published in September.

AVERAGE PRICE FOR AUGUST

	Plant Price	Delivered Price
Milwaukee, Wis.	$10.00	$12.00
Mishawaka, Ind.	11.00	....
Seattle, Wash.	14.50	16.50
Sebewaing, Mich.	10.00	....
Syracuse, N. Y.	14.00	16.00C/L 20.00L/C
Watertown, Mass.	12.50	13.50

STATISTICS FOR JULY AND AUGUST

	†July	‡August
Production	1,990,750	2,820,860
Shipments (rail)	108,000	257,500
Shipments (truck)	2,403,774	3,259,942
Stock on hand	964,863	1,059,984
Unfilled orders	1,125,000	2,793,944

† Eight plants reporting: incomplete, one not reporting production, two not reporting stock on hand, and three not reporting unfilled orders.

‡ Nine plants reporting: incomplete, one not reporting production, three not reporting stock on hand, and three not reporting unfilled orders. One of the unfilled orders of Paragon Plaster Co., Syracuse, N. Y., not included in the tabulation above, is for 165,000 brick to be used on the New Victor, N. Y., Central school.

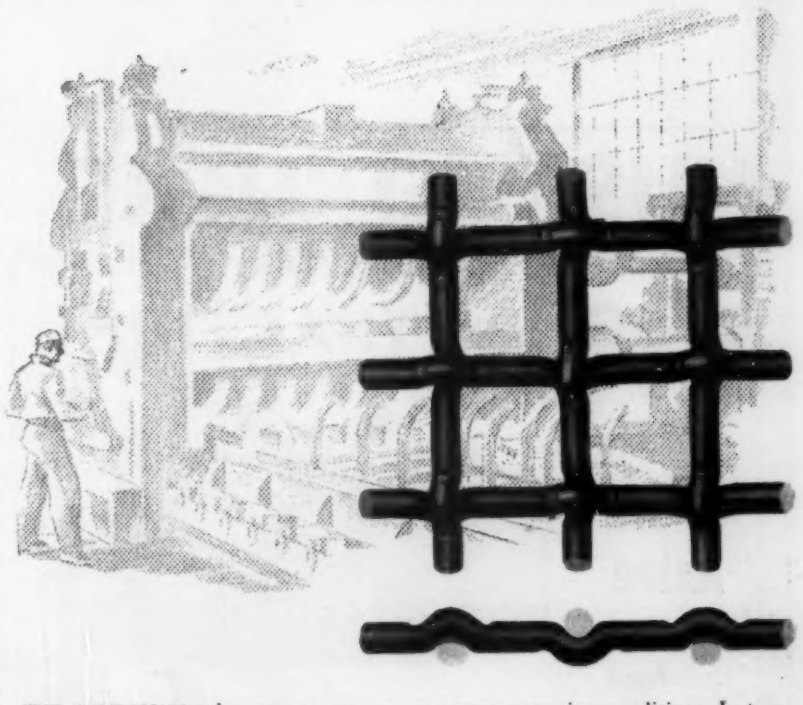
Expanding Operations in Sand and Gravel

JAHNCKE SERVICE, INC., New Orleans, La., is planning to build a new sand and gravel plant at Grangeville, La. The company is also putting in handling equipment and a bulk cement bin of 300-bbl. capacity to be used in connection with its ready-mixed concrete and dry batch activities in New Orleans.

SCREENING STEEL

THAT CAN "TAKE IT"

because it's Roebling Custom-Made!



IT DOESN'T take an expert to appreciate that *long-lasting screening* must start with *long-lasting steel.* There are many links in the process of making screening — screening that will stand up under the relentless beating of crushed stone and gravel. But certainly steel-making is the most important link of all.

That's why Roebling makes its own screening steel. That's why it makes steel by special *custom-methods* that assure a steel that can "take it" under severest operating conditions. In fact, Roebling Screening Quality is under complete Roebling control — from steel making, through wire drawing and fabrication, to final shipment.

Ask our nearest representative as to the money-saving service which Roebling "Abraso" Screening is providing in stone and gravel plants.

JOHN A. ROEBLING'S SONS CO.
TRENTON, N.J. *Branches in Principal Cities*

ROEBLING ABRASO SCREEN

TRADE JERSEY MARK

NEARLY 100 YEARS OF WIRE FABRICATING SPELL THE DIFFERENCE

FINANCIAL NOTES

RECENT DIVIDENDS ANNOUNCED

Arundel Corp.	$ .25	Oct. 1	Medusa Cement Co.	.75	Oct. 1
Ideal Cement Co.	.35	Sept. 30	Medusa Cement Co., pfd.	1.50	Oct. 1
Kelley Island Lime & Trans. Co.	.25	Sept. 30	Southern Phosphate Corp.	.15	Sept. 30
Lehigh Portland Cem. Co.	.37½	Nov. 1	Superior Portland Cem. Co.	.82½	Oct. 1
Lone Star Cement Co.	.75	Sept. 30	Yosemite Portland Cem. Co., pfd.	.05	Oct. 1
Longhorn Portland Cem. Co.	.25	Sept. 16			

HUSKY TRUCKS
for TOUGH JOBS
Get Better TRACTION
with
TWO
Driving
Axles
Under
the load

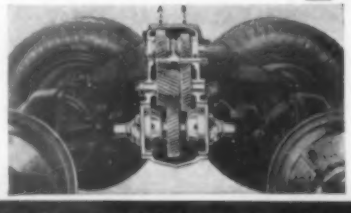
Use THORNTON
Four-Rear-Wheel
DRIVE

SAVE
MONEY

Take a 1½ to 3-ton truck and let us quickly convert it to a husky, reliable unit of 30,000 lbs. or more gross weight capacity. Two gear ratios for Power and Speed, Walking-Beam flexibility gives real

TRACTION

and Perfect Balance Between Power and Weight.



THORNTON TANDEM CO.
8701-8779 GRINNELL AVE. DETROIT, MICH.

Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL which gives traction when slippery going makes trucks equipped with ordinary differentials helpless.

"When you need TRACTION you need THORNTON"

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, retired $218,000 of its first mortgage and collateral trust convertible bonds October 1, leaving less than 50 percent of the $2,200,000 original issue outstanding. Next year the interest rate on the bonds will be increased from 5 to 5¼ percent.

•

ARUNDEL CORP., Baltimore, Md., reports for the eight months ended August 31, 1940, a profit of $612,476 after depreciation, etc., but before federal income taxes, comparing with a profit of $914,421 in the first eight months of 1939. Joseph V. Hogan, president, said, "While the result as compared with 1939 shows a considerable decrease, nevertheless the earnings for the eight months of 1940 are only $171,000 short of the total net of 1939." The outlook, he reported, is very satisfactory.

•

BLUE DIAMOND CORP., Los Angeles, Calif., and its wholly-owned subsidiary Blue Diamond Corp., Ltd., for the six months ended June 30, 1940, shows a net profit of $89,766 after all charges. This compares with a net profit of $81,978 in the corresponding period a year ago.

Sales for the first six months this year were reported at $2,120,566, as compared with $1,730,833 in the like period last year. Cost of sales and delivery expense, including depletion and depreciation for the first six months in 1940 were $1,866,512 as compared with $1,470,134. Lower price levels and a smaller margin in profit were attributed by President Van Valkenburgh as the causes for the disproportionate earnings on the larger volume of business.

•

LONE STAR CEMENT CORP., New York, N. Y., has issued the following statement of consolidated earnings for the quarter ended June 30:

3 mos. to June 30:	1940	1939
Sales	$5,662,040	$ 5,651,288
Costs & expense	3,640,457	3,622,123
Depreciation & depletion	718,933	702,871
Operating profit	1,302,650	1,326,294
Other income	58,441	55,305
Fed. inc. tax, etc.	399,608	265,977
Total income	1,361,091	1,381,599
① Misc. charges	143,429	191,961
Net profit	818,055	923,661
6 mos. to June 30:		
Sales	$9,892,146	$10,029,087
Costs & expense	6,485,761	6,465,767
Deprec. & depl.	1,272,309	1,327,453
Operating profit	2,134,075	2,235,867
Other income	117,928	105,181
Total income	2,252,003	2,341,048
Federal income tax, etc.	620,382	491,314
① Misc. charges	260,012	340,015
Net profit:		
March quar.	553,555	586,058
June quar.	818,055	923,661
6 months	$1,371,610	$1,509,719

① Includes provisions for doubtful account and contingencies.

NEW

RIP-CORD CLOSURE*

PERMITS ONE BAG INVENTORY
ANSWERS YOUR PRESENT DAY CLOTH BAG PROBLEMS

•

HERE'S HOW!

1. Permits use of one size bag for cement of all degrees of fineness.
2. Permits use of same bag for all types of cement . . . and with low cost identification.
3. Increases effective, useful capacity of small bags.
4. Eliminates damage in opening bags.
5. Eliminates cost of hemming bags.
6. Keeps bag house costs at minimum level.

Rip-Cord Closure simplifies bag inventory . . . saves bag costs. Write for further facts today.

BAG CLOSURE CORPORATION
70 SOUTH MAIN STREET
NAZARETH, PENNSYLVANIA

**Covered by patents and patents pending*

Financial Notes

(Continued from page 70)

UNITED STATES GYPSUM Co., Chicago, Ill., is another company which has been receiving substantial orders for wallboard to be used in cantonments. The company also has under consideration the construction of a pressboard plant at Greenville, Miss., according to local reports.

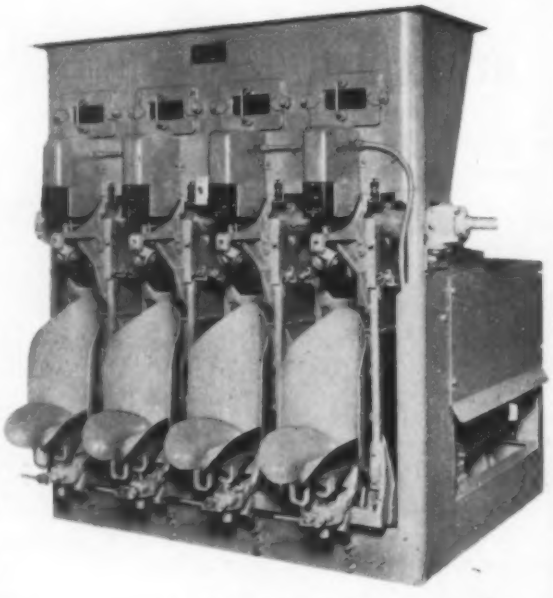
•

NEW YORK TRAP ROCK CORP., New York, N. Y., has made available approximately $400,000 for the purchase of first mortgage sinking fund gold bonds. As a result of tenders made under date of May 27, 1939, $493,000 principal amount of bonds were acquired by the company. At that time $600,000 was made available for this purchase. Smith, Barney & Co., 14 Wall street, New York, N. Y., investment bankers, are accepting tenders of bonds for the company.

•

BASIC DOLOMITE, INC., Cleveland, Ohio, reports for the first six months ended June 30, 1940, a net income of $162,193 after depreciation, depletion, interest, federal income taxes, etc., equal to 46c a share on 350,000 shares of common stock. This compares with a net profit of $65,554 in the six months ended June 30, 1939.

THE "MODERN" AUTOMATIC PACKING AND WEIGHING MACHINES



CLEAN PACKAGES are obtained because the discharge of the filled bag is delayed until all excess material from the spout and all excess air from the bag has been evacuated. This delayed period is adjustable for different materials.

AUTOMATIC operation of the packer requires only that the operator place the bag on the filling tube and press the push button. Filling, weighing, evacuation and discharge are then completed without any manual assistance.

ACCEPTANCE AND APPROVAL of the "MODERN" Packer by many of the larger cement manufacturers has been proved by repeat orders.

1. **An absolutely clean package.**
2. **A definitely closer control of weights**
3. **A distinct saving in labor—less manual operation—easier to operate.**
4. **Greatly increased CAPACITY—up to 1500 bags per hour with one operator.**
5. **Elimination of "grief" in packing air tight moisture proof bags.**

MODERN VALVE-BAG COMPANY

ALLENTOWN . . . . . PA.

LEHIGH PORTLAND CEMENT Co., Allentown, Penn., reports a net profit, after depreciation, depletion, obsolescence, and taxes of $2,161,213 for the 12 months ended June 30, 1940, as compared with $1,606,937 for a like period in 1939. This is equal to $2.58 a share on the common stock and compares with $1.83 a share in the preceding year. The company also reported that during May and June it purchased 19,889 shares of class A and 16,431 shares of class B stock of Great Lakes Portland Cement Corp., and that it now owns 42,489 of the 43,302 shares of class A and also holds 36,531 of the 38,619 shares of class B stock.

•

NATIONAL GYPSUM Co., Buffalo, N. Y., reports a very active business stimulated in considerable part by defense demands, all 16 plants operating at capacity. An order has been received from the federal government for 5,000,000 ft. of wallboard costing $180,000 which will be used to rebuild soldiers' living quarters in the training camp near Grand Rapids, Mich., and at Fort Dix, N. J.

•

PENNSYLVANIA GLASS SAND Co., Lewistown, Penn., had a net profit of $305,952 for the six months ended June 30, 1940, after depreciation, depletion, interest, and federal income tax, estimated on basis of new rates. This compares with a net profit of $238,313 for a similar period in 1939. It has been announced that the company's 1st 3½s, 1960, amounting to $3,700,000, have been listed on the New York Stock Exchange.

•

SCHUMACHER WALL BOARD CORP., Los Angeles, Calif., reports a net profit of $44,772 for the three months ended July 31, 1940, the third highest level for any quarter in the company's history. The corresponding period in 1939 showed a net profit of $39,591.

•

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., has called for redemption on August 31, all of its first mortgage 4½ percent sinking fund bonds, maturing December 1, 1960, of which $4,201,000 are outstanding, at 105 and accrued interest.

•

LONGHORN PORTLAND CEMENT Co., San Antonio, Texas, shows earnings of $1.23 per share for the six months ended June 30. This company was recently awarded a 470,000 bbl. contract by the Federal government.

•

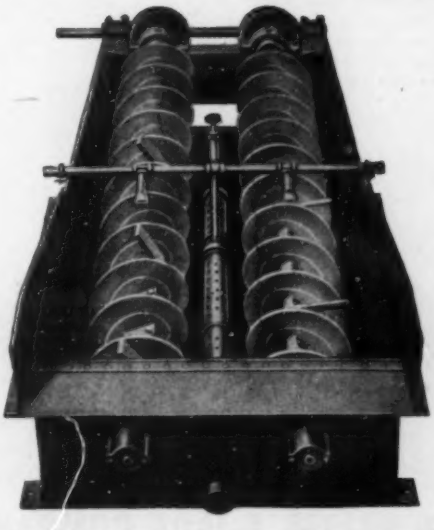
PEERLESS CEMENT CORP., Detroit, Mich., has reported a profit of $132,628 for the first half of 1940, after providing for federal income tax.

CROWDING the BLASTING CREW

LIMA shovels are designed and built for the toughest job a shovel ever gets – quarry work. Because of the severe service encountered in rock digging, every part of the LIMA is made unusually strong. The boom and dipper handle are of the welded box-type design – no rivets or bolts to weaken their construction. The powerful chain crowd which follows the center line of the boom is positive in action and will hold the dipper firmly against the face, filling the dipper without coaxing. The crawler base and machinery frame are one-piece steel casting, built unusually strong to withstand all shocks and stresses encountered in rock digging. Power on the job is supplied by a gasoline, Diesel or oil engine or electric motor. These points of construction, in addition to such outstanding features as independent clutches; anti-friction bearings throughout; helical cut gears; splined shafting and square lever shafts are advantages that help step up output and reduce operating costs. You can always crowd the blasting crew with a LIMA quarry shovel.

LIMA LOCOMOTIVE WORKS, INCORPORATED
SHOVEL AND CRANE DIVISION — LIMA, OHIO, U. S. A.

AN EAGLE WASHER WILL MODERNIZE YOUR PLANT



TODAY'S specifications require clean sand and more fine sizes which were formerly wasted. This EAGLE SPIRAL SCREW WASHER will produce just the product to meet the strictest specifications.

The sectional spiral screws draw the aggregates to the center of the tub and convey them upward to the discharge end, at the same time thoroughly scrubbing, bent bar agitators assisting the screw action. Wash water inlets arranged along the tub bottom between the two screws, carry foreign material to the surface where it is washed out with overflow water at lower tub end.

With an EAGLE SPIRAL SCREW WASHER in your plant you will be sure of aggregates with no mud, silt, coal, leaves, sticks, shale and some types of clay balls. You can also work deposits you thought impossible.

For further details write for descriptive literature on EAGLE SINGLE AND DOUBLE SCREW WASHERS, EAGLE PADDLE LOG WASHERS and EAGLE "SWINTEK" SCREEN NOZZLE LADDER.

EAGLE IRON WORKS *Des Moines, Iowa*

Actions -- SPEAK LOUDER THAN WORDS...

"Over 12,000 hours of steady operation in hard steel plant service before even a bushing was replaced ...using an average of 1.675 gallons of oil per hour...the crane was in service 24 hours per day a large part of this time."

• • • • •

The above statements are those of a large steel company operating a 30-ton Industrial Brownhoist Diesel crane purchased in 1937. The figures are typical of the performance data which come to us from other users of Industrial Brownhoist Diesel locomotive cranes.

Compare these operating costs with those of your present crane.

INDUSTRIAL BROWNHOIST

GENERAL OFFICES: BAY CITY, MICHIGAN
DISTRICT OFFICES
New York, Philadelphia, Pittsburgh, Cleveland, Chicago.

If you are SCREENING highly abrasive materials

You can get longer service life . . . and lower screening costs . . . with Hendrick Heat Treated Perforated Plate. It is available in any size or shape of perforation, flat or double corrugated.

Write for a copy of "Hendrick Perforated Plate for Vibrating and Shaking Screens." Contains a wealth of information, including complete data on all types and sizes of openings.

HENDRICK MANUFACTURING CO.

47 Dundaff St., Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types, Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

The BROOKS-TAYLOR Lime Putty Plant

Jahncke Service added three ageing tanks to their putty plant in New Orleans to take care of increased business. Why not supply your customers with lime mortar?

CHICAGO BRIDGE & IRON COMPANY

Chicago	2452 McCormick Bldg.	Tulsa	1650 Hunt Bldg.
New York	3396-165 Broadway Bldg.	Houston	918 Richmond Ave.
Cleveland	2265 Rockefeller Bldg.	Philadelphia	1651-1700 Walnut St.
Detroit	1553 Lafayette Bldg.	Boston	1564 Consol. Gas Bldg.
Dallas	1487 Praetorian Bldg.	San Francisco	1093 Rialto Bldg.
Birmingham	1505 N. 50th Street	Los Angeles	1458 Wm. Fox Bldg.

A New Type of Bag Closure

By R. B. FORTUIN *

CLOSING and subsequent opening of cloth bags in the cement industry has presented new problems in recent years due to the greater volume of finer ground products and the necessity of finding an easy way to identify the contents other than by printing on the bag itself. ASTM specifications for five types of portland cement require that each package be clearly identified as to the type of contents.

Two cement manufacturers facing these problems; namely, Penn-Dixie and Nazareth, working originally alone, and now jointly through the Bag Closure Corporation collaborated with the author in the development of this unique method. Patents have been acquired for what has been called the Rip Cord Closure.

This method of closure is applied by sewing a 70-lb. minimum tensile strength cord and paper strip across the face of the bag adjacent and parallel to the mouth. About a 2-in. loose extension of cord and paper is left at both sides of the bag. The removal is accomplished by grasping either projection of loose cord and ripping the thread stitches toward the opposite side of the bag. The ripping operation fractures the needle threads progressively across the bag without any damage to the fabric.

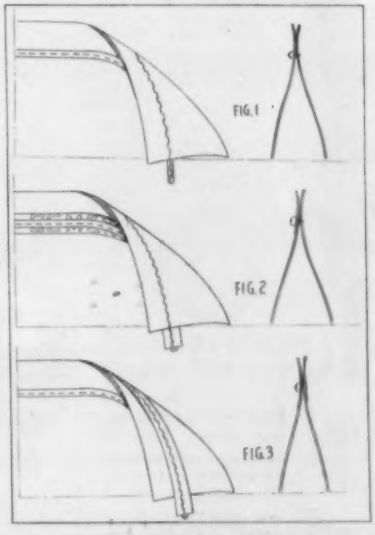
Showing how rip cord closure is easily removed from cloth bag

By placing any desired printing on the paper strip, it may be used to describe the contents of the package, and would be particularly desirable for printing code numbers and specifications for various portland cements required by municipalities and laboratories.

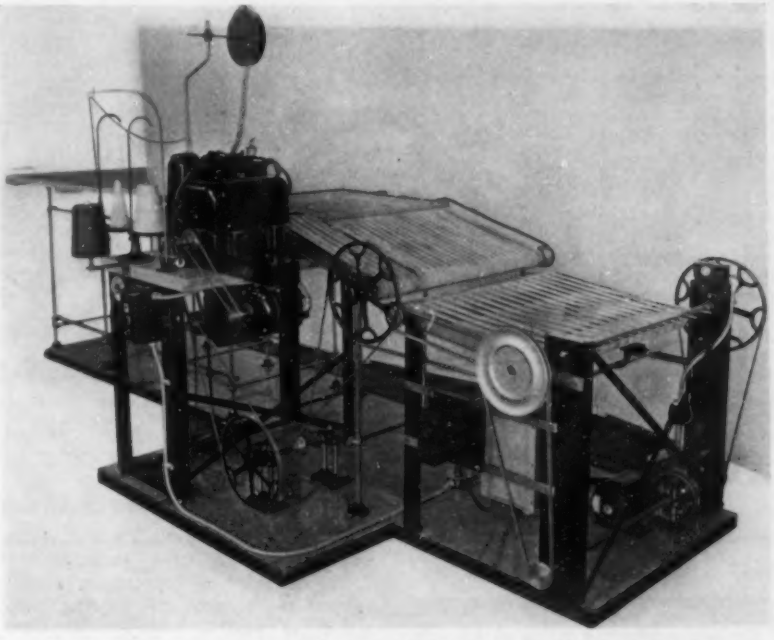
To apply the rip cord closure method to cement bags, a special high speed sewing machine production unit has been developed. The sewing machine with puller is fitted with a special foot for feeding cord and paper strip simultaneously.

The conveyor table is constructed of a series of parallel 1-in. canvas belts running on 3-in. pulleys, the speed of which is synchronized with the speed of the sewing machine. As the bags are drawn through the puller attachment of the sewing machine an automatic scissor type knife cuts the cord and paper strip in the span between bags. The length of loose cord and paper left projecting from the edge of the bag by the knife can be accurately gauged by the operator. A finger switch located directly in the course of the travel of the bag as it is drawn through the puller actuates the knife cutter.

Operating at double the speed of the table conveyor, the discharge conveyor passes the bags on to the fingers of the automatic stacker. These fingers in the "rest position" lie horizontally between the belts of the discharge conveyor. A switch, located between the belts of the discharge conveyor and tripped by the bag, actuates the operation of the stacker which can be set to stack 50 or 100 bags at the option of the operator. A bell signal and a counter are mounted on the sprocket wheel of the cutter, the bell sounding as each fiftieth bag passes through the cutting knife.



Three methods of rip cord closure of cement bags. Fig. 1: Closure using the cord only. Fig. 2: Using the cord with the paper strip under the cord, both being sewed on the face of the bag. Fig. 3: Using the cord and paper strip with the cord sewn on the face of the paper strip on the opposite side of the bag. This is an alternate use and has the advantage of removing the broken stray threads from the fabric when the paper is removed from the bag



Specially designed sewing production unit which sews the rip cord closure on cement bags. Feeder table is to the extreme left, followed by sewing head, automatic cutter, conveyor table, discharge table, and automatic stacker

An operator with average skill can apply the rip cord closure at an average rate of 900 or more bags per hour. Sufficient cord is carried on the machine for a two-hour run without

* Secretary, Bag Closure Corp., Nazareth, Penn.

changing, and new rolls of paper are added on the "fly."

Applying rip cord closure, with or without the paper strip, is accomplished at low cost.

In addition to the ease in opening and closing the bag with this type of closure, there are other advantages. In comparing the portland cement of 10 years ago with that of today, it has been found that the present fineness requires a larger package. The old standard was a 30-in. cut 36-in. cloth bag. Owing to the increased fineness, it has been necessary to purchase new bag stock in 30-in. cut 37-in. size.

Application of the new closure method makes it possible to continue to use 30-in. cut 36-in. bags for all cements of a surface area up to 2600 sq. cm. per gram and a 30-in. cut 37-in. bag for high early strength cements in excess of surface area of 2600 sq cm. per gram. It is not necessary to have a hem on the bag. The paper identification strip may be placed under the cord or on the opposite side of the bag. The operator of the equipment may vary the distance at which the cord is placed from the edge of the mouth of the bag, controlling the volume of the bag. With this method of closure, the bag appears as a square package, not round at one end and square at the other.

NO OTHER TRUCK MIXER HAS THESE!

1 Quick-as-a-flash charging.

2 Ability to handle lower slump mixes.

3 New revolutionary mixing principle in the Rex "self-cleaning-while-mixing" drum.

4 Rex anti-freeze water system with positive injection of water into the heart of the batch for faster mixing.

5 The finest drive ever put on a truck mixer—the improved Rex Chabelco chain drive and Rex twin clutch transmission.

Be Right—Buy Rex!

NOW!...A LINE OF PROVED *Hi-Discharge* MOTO-MIXERS

For over eleven years Rex has led the truck mixer field in the development of faster, more efficient truck mixers! Here's the latest, the Rex Hi-Discharge Moto-Mixer, now thoroughly proved on jobs of all sizes and types.

Rex—not you—has done the experimental work!

Not just another truck mixer—the new Rex Hi-Discharge has features never before offered on any truck mixer! Study the list at the left—a list of features you've been waiting for—found solely on these great new Rex's. Built to the newly adopted standards, the Rex Hi-Discharge gives greater payload capacity and the greatest spouting range found on any truck mixer of equal size. *All this—plus the many Rex-pioneered advantages found on all Rex Moto-Mixers.*

Check the list of Rex features—you will see why it pays to depend on Rex for up-to-date, lower cost ways to mix, haul and place concrete! Send for free folder, "A New Era in Truck Mixer History." Address Chain Belt Company, Dept. MM-10, 1649 W. Bruce St., Milwaukee, Wisconsin.

CHAIN BELT COMPANY OF MILWAUKEE

REX

Hi-Discharge MOTO-MIXERS

Illinois Mineral Industries Conference

DEDICATION of the new Illinois Natural Resources Building at Urbana will be held on November 15, under the official auspices of the State of Illinois with the Illinois Mineral Industries Committee assisting in the arrangements. The dedication will be preceded by a meeting on November 14, of the Mineral Industries conference. This beautiful building will house the 31 offices of the Illinois Geological Survey in its five floors, and there will be 26 laboratories.

Court Decides Blasting May Be Done

READY MIXED CONCRETE Co., Kansas City, Mo., received permission to operate its quarry near an outlying residential area when Judge G. A. Roberds modified his temporary injunction to permit operations on condition that the work must not be damaging to houses in the vicinity. He also ordered that no blasting be done except between the hours of 7 a.m. and 7 p.m.

Diesel-Electric Locomotives for Quarry

FIVE 35-ton Diesel-electric locomotives are being constructed at the Erie, Penn., works of the General Electric Co., for use by a large limestone quarry in western Pennsylvania. All rail operations are above ground. The locomotives will each be equipped with two 190-hp. Hercules Diesel engines, each direct-connected to a G.E. generator. Two traction motors, one on each axle, will be driven from the power unit.

Concrete Pavement Yardage

AWARDS of concrete pavement for August, 1940, have been announced by the Portland Cement Association as follows:

	Square yards awarded during	
	August	first 8 months
Roads	4,048,572	26,549,076
Streets and Alleys	2,367,543	11,180,783
Airports	868,405	2,036,081
Totals	7,284,520	39,765,940

Fire Destroys Quarry Plant

PENRY STONE Co., Radnor, Ohio, suffered a fire loss estimated at $18,000 early in September. A new Diesel engine was lost together with crushing and screening equipment, and a large supply of fuel and lubricating oils.

The Williams "SLUGGER" Crusher and Pulverizer Handles "ONE MAN" Stone ● Saves Sledging

Also Makes 1¼", ¾" or Agricultural Limestone in One Operation

CUTAWAY VIEW of "Slugger" showing heavy duty hammers, liners and discs.

By reducing large rock to 1¼", ¾" or agricultural limestone in one operation, the "Slugger" has enabled operators to produce these sizes at a low cost per ton and with small investment.

Features include—Manganese steel hammers, heavy duty SKF bearings, adjustable breaker plate, hammer adjustments overcome wear, economical to operate.

The "Slugger" is built in Seven Sizes—from 30 to 150 horsepower —write for illustrative bulletins today.

The Williams Patent Crusher and Pulverizer Co.

800 St. Louis Ave., St. Louis, Mo.

SALES AGENCIES

CHICAGO 37 W. VanBuren
NEW YORK 15 Park Row
OAKLAND, CALIF. 1629 Telegraph Ave.

Williams

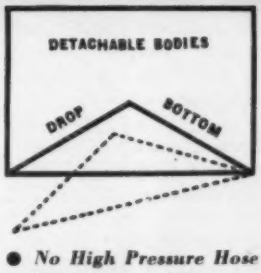
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

PATENT CRUSHERS GRINDERS SHREDDERS

DEMPSTER DUMPSTER

LF-2—ONE OF THE NEW MODELS

DEMPSTER-DUMPSTER Pays Its Own Way . . . Is Self-Liquidating . . . Turns Losses Into Profits. Get the Facts NOW! There's a Dealer Near You.



- *No High Pressure Hose*
- *No Counterweight*
- *No Auxiliary Jacks*

DEMPSTER-DUMPSTER is the spearhead of attack against operating wastes. One unit can serve four to ten buckets . . . does the work of four or five trucks. No wasted man-hours, no idle labor. The DEMPSTER-DUMPSTER is never idle on the job, constantly on "the go," no lost motion, no waiting for it to be loaded and returned. Buckets handle up to 6 yards, depending upon the material. Costly breakdowns are unknown with DEMPSTER-DUMPSTER on the job. Simply constructed of rugged materials, DEMPSTER-DUMPSTERS have been in service for more than 6 years without a major breakdown. Write for complete details. Just ask for Bulletin No. 501.

Exclusive sales territories available for responsible dealers — Wire for details

DEMPSTER BROTHERS, Inc. KNOXVILLE TENNESSEE

Cement Plants Start Up

THE MONARCH CEMENT CO., Humboldt, Kan., has resumed operations after a shut-down of about a month with bins full. The plant started up in advance of expectations due to a heavy demand for a certain cement.

•

LONE STAR CEMENT CORP., Hudson, N. Y. plant, has gone into production after a two-week shut-down to install unit pulverizers.

Dredge Permit Sought

SOUTHERN MATERIALS CORPORATION, Norfolk, Va., has requested a federal permit to dredge sand and gravel in the James river at Kingsland Beach. The company proposes to load the material into barges.

Enlarged Quarters

ELKAN STONE TILE CO., Macon, Ga., manufacturer of cast stone, is putting up a 60- x 60-ft. one-story addition to its plant.

Shovels for Mines

BULLETIN 423, Bureau of Mines, U. S. Department of the Interior, obtainable from the Superintendent of Documents, Washington, D. C., for 25c is a 97-p. book on "Mechanical Shoveling in Underground Metal Mines," by McHenry Mosier and J. H. Steinmesch. It gives a lot of data on power shovels of special design for operation in cramped quarters, whether the operation is for ore, limestone or other mineral. ROCK PRODUCTS readers who mine will find it helpful.

New Gravel Developments

L. W. HAYS, Bethany, Mo., contractor, has started operating the large gravel pit owned by Ellis Lionberger at Dawn, Mo. When the Chicago, Milwaukee, St. Paul & Pacific Railroad built its right-of-way and track through this territory, this pit was one of the largest in the country.

•

CAMARGO, OKLA., may have a large sand and gravel plant located in the immediate vicinity, according to Phillip Hocker, banker of this city. Sand and gravel would be obtained by dredging.

•

HASKELL SAND CO., Haskell, Okla., has started operations on the Cameron farm east of town. Boynton Ogle, in charge, advises that the sand is now being recovered by means of a centrifugal pump.

Change Ownership

WATERLOO QUARRY CO., Waterloo, Ill., is now operated by two brothers, C. and C. J. Traukle. The new owners bought out Otto Wolf. Several plans are under consideration to improve the plant, including the installation of a 125-hp. Diesel engine and a hammermill that will produce 200 tons of agstone in eight hours.

Fight Dust Damage Suits

SANTA CRUZ PORTLAND CEMENT CO., San Francisco, Calif., with plant at Davenport, Calif., has been fighting a suit by ranchers seeking to enjoin the company from operation, claiming that dust from the cement plant operations had damaged crops.

•

SUPERIOR PORTLAND CEMENT, INC., Seattle, Wash., may be confronted with the payment of several court judgment claims for dust damages by owners of property near its Concrete, Wash., plant if a Superior court judgment for $500 in favor of Guy Powell is sustained.

Talc Mill Addition

W. H. LOOMIS TALC CORP., Gouverneur, N. Y., is planning a one-story addition for expansion in its grinding department, and also to provide for additional storage and distribution.

Let PARSONS De-Dust Your Plant

PAYS FOR ITSELF QUICKLY
THEN PAYS YOU A PROFIT

This PARSONS Unit Type Dust Arrestor is designed especially for collecting dust from your crushers, screens, bins, elevators — everywhere you rehandle your stone. It is simple and compact in design, with fan and drive mounted directly on top so it can easily be set in any convenient space near the equipment being ventilated. The unit can be made portable by means of a small truck and moved about to various pieces of equipment as needed.

A PARSONS Unit Type Dust Arrestor, built to handle 2,000 cu. ft. of air, complete with fan and 5 hp. motor, costs surprisingly little. The profits from the sale of the dust collected will soon pay for it and then pay you.

Let us install one of these Unit Type Arrestors in your plant—entirely without obligation. The results will convince you that you cannot afford to be without it. Write for more information today.

A COMPLETE LINE OF DUST ARRESTORS
Automatic—Oval Type Bag—Unit Type Oval Bag—
All Metal Parclone

PARSONS

PARSONS ENGINEERING CORPORATION
3595 E. 82ND STREET CLEVELAND OHIO

OLD EQUIPMENT IS A LUXURY!

Here's a new angle on an old problem: when you add up your repair bills, figure your time losses, and estimate costs for slow digging, you'll find that you're actually "milking" your profits to support that old shovel!

Here's the solution: trade in the old machine on a new P&H — and put more life in your profit column. There are facts about P&H's dependability, low cost operation, greater yardage that you'll appreciate. We'd like to tell you the story.

P&H excavators built in all sizes from ⅜ to 5 cu. yds. capacity — gasoline, Diesel or electric power. Write for literature.

General Offices: 4465 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

RELIABILITY and PRODUCTION

DAVENPORT LOCOMOTIVES

STEAM • GASOLINE • DIESEL

LOCOMOTIVES MECHANICAL or ELECTRIC DRIVE

If your operations call for locomotives you'll do well to rely upon sturdy and efficient Davenports for Dependability and Economy. Built to last, designed with the latest features and available in the size and type most perfectly suited to your needs, Davenport Locomotives — backed by more than forty years of proven merit —are your BEST BUY.

Submit your requirements and permit our engineers, without obligation, to present recommendations and prices.

Export Office
BROWN & SITES
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Cable Address "BROSITES"

Complete information is yours for the asking.

DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION DAVENPORT, IOWA

IT'S TELLURIUM 4400-VOLT CABLE

Still Alive and Working

ACCORDING to our reporter, the cables shown are tellurium-rubber types in use on a coal-stripping operation. The large one supplies power at 4400 volts to a 30-cubic-yard stripping shovel.

After having been twisted in that muck and run over by trucks, neither cable showed a single leak or break. So far as we know, both are still supplying power at their rated voltages. Many other users report stories of similar harsh treatment, with similar results—little or no trouble. That's why, with tellurium, you can count on saving money by reducing maintenance cost.

If you have need for a tough cable that doesn't mind being dragged through mud or over sharp rocks and gravel, tellurium is your buy. This cable, specially designed for mining machinery, gathering locomotives, electric shovels—for all portable uses—will save you money both on replacements and upkeep.

In addition to tellurium, G.E. has other types of insulated cable to fit every one of your particular needs. If your jobber can't supply you, or if you would like special information, see the nearest G-E Office, or write directly to General Electric, Schenectady, N. Y.

GENERAL ELECTRIC INSULATED CABLE
ALWAYS THE RIGHT TYPE FOR EACH JOB

GENERAL ELECTRIC
500-20

Indict Bentonite Producers

INDICTMENTS have been returned by a federal grand jury against five corporations and eight individuals, alleging a conspiracy to control the production and the sale of bentonite in violation of the Sherman Anti-Trust Act. Government attorneys allege the defendants controlled more than 90 percent of the bentonite production in this country by means of licensing agreements under patents.

Defendants include the following: American Colloid Co., Lead, S. Dak., and Paul Bechter, president; Wyodak Chemical Co., Cleveland, Ohio, Ralph Ditty, president, and Louis H. Heyl, general manager; F. E. Schundler Bentonite Co., Belle Fourche, S. Dak., F. E. Schundler, president; Whitehead Bros. Co., New York, N. Y., Alfred J. Miller, president, and A. Y. Gregory, vice-president; Processing Corporation of America, New York, N. Y., Joseph A. Anglada, president, and Nelson Lytell, patent attorney.

Death Valley Fluorspar

CARDINAL GOLD MINING CO., Bishop, Calif., has started development work on a large fluorspar mine in Death Valley. It is ultimately planned to put in a modern flotation plant to process the mineral. Victor Bongard is general manager.

Phosphate Domestic Demand Offsets Exports

CONTRARY to what might have been expected, the Bureau of Mines reports that more phosphate rock was shipped by American producers during the first half of 1940 than during the like period of the preceding year. Owing to loss of markets in Central Europe, shipments of Florida rock declined, but not enough to offset the increased tonnage shipped from Tennesseee. Total shipments rose to 1,766,732 long tons compared with 1,750,114 tons during the first six months of 1939. The increase of 342,685 tons in domestic consumption indicates a 28 percent increase over that of the corresponding 1939 period. Super-phosphate manufacture, however, increased only 21 percent during the 5-month period for which data are available while shipments rose only 3 percent.

A report from the Tennessee field as of September 8th states that there is a very active shipping season for ground rock to farmers for direct application, both by rail and truck. Other consuming channels are also withdrawing against contracts, and some spot sales for iron furnaces are reported in high grade lump.

Slag Production Increases

NATIONAL SLAG ASSOCIATION, in a report recently presented to the Bureau of Mines by Secretary T. E. Sheafer, reports that during 1939, 9,108,375 short tons of commercial air-cooled and granulated blast furnace slag valued at $6,354,153 were produced by 36 companies operating 72 plants. Of this, 7,920,281 tons valued at $6,232,116 were air-cooled slag. In 1938, the total short tons of commercial blast furnace slag as reported by 34 companies operating 70 plants were 7,978,066 valued at $6,246,615 of which 7,321,259 short tons were air-cooled slag valued at $6,167,892.

As in 1938, the greatest outlet for air-cooled blast furnace slag was for concrete aggregate, bituminous pavement construction, railroad ballast and subbase. Likewise the principal use for granulated slag was for sealed cushion courses and subbase.

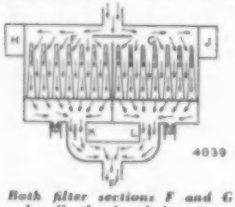
Cement Plant Improvement

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has plans for a one-story addition to its mill at Iola, Kan., and also silos for storage and distribution of cement. The cost with equipment will be about $125,000.

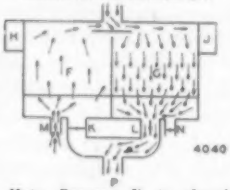
DUST CONTROL at its Best!

Sly Dust Filter on roof of cement silo

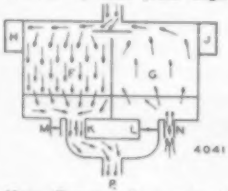
WITH SLY YOU CAN HAVE AUTOMATIC CONTINUOUS OPERATION



Both filter sections F and G handle the dust-laden air.



Main Damper K is closed, small damper M is open for reverse air-flow through filter F, to assist shaker drive H, which is now in operation, in removal of dust from bags.



Main Damper L is closed, small damper N is open for reverse airflow through filter G, to assist shaker drive J, which is now in operation, in removal of dust from bags.

Sly Dust Filters clean the air completely by *filtering* the dust out of it. They are not expensive and in the rock products field (where reclaimed dust is valuable) repay their cost. They are the result of over 40 years' specialization in the field.

The Sly system offers automatic control of shaking device—automatic starting and stopping of shaker motor, control of fan, and elimination of human element entirely during periodic shaking.

And, if desired, *Continuous Operation!* In some industrial processes dust control must be continuous *without interruption for operation of bag shaking mechanism.* See diagrams at left.

Ask for Dust Control Bulletin 98 and send details of your problem. We'll gladly give you an estimate.

THE W. W. SLY MFG. CO.

Dust Control Equipment for Every Industrial Purpose

4746 Train Avenue Cleveland, Ohio

Branch Offices in Principal Cities

12 PROVEN REASONS
Why You Should Specify
COLMONOY
NICKEL BASE HARD FACING ALLOYS

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2. Resists wear, corrosion and galling
3. Applies more easily
4. Less facing material required
5. Smoother flowing
6. Lower melting point
7. Less welding time required
8. Less preheating required
9. Applies to all ferrous base metals
10. Finishes to a high polish minimizing friction
11. Can be hot wiped
12. Does not service check

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Contains full information concerning all the various grades of COLMONOY that meet every hard-surfacing requirement.

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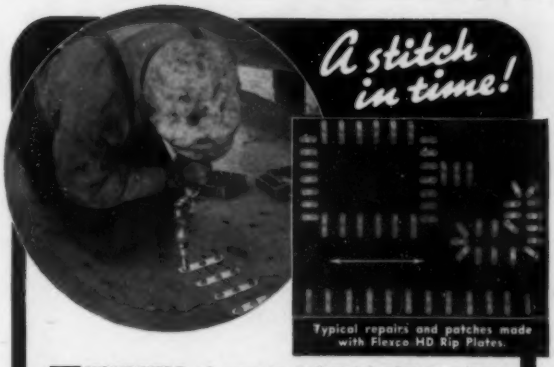
COLMONOY
Hard Surfacing Alloys and Overlay Metals



Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
4684 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

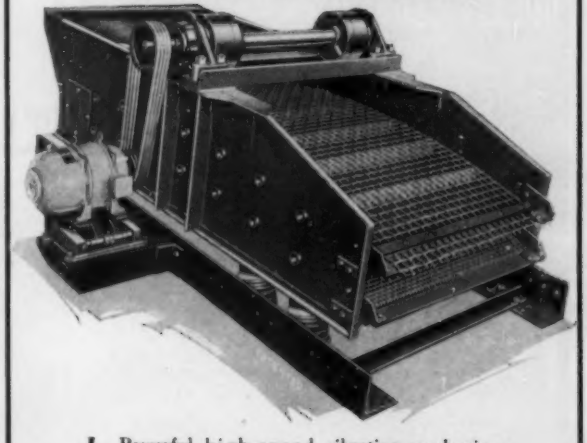
Blaw-Knox is the only manufacturer offering complete equipment for ready mixed concrete, including Trukmixers and Agitators, Ready Mixed Concrete Plants and Truck Mixer Loading Plants of all capacities and types.

Send for Blaw-Knox Catalogs Nos. 1566 and 1582.

BLAW-KNOX DIVISION of Blaw-Knox Company
FARMER'S BANK BUILDING PITTSBURGH, PA.

BLAW-KNOX *Truck Mixer* **LOADING PLANTS**

DEISTER PLAT-O VIBRATING SCREEN



1. Powerful high-speed vibrating mechanism.
2. Screen cloth automatically held under uniform tension.
3. Any one screening surface changed without disturbing remaining decks.
4. Cushioned vibration.

DEISTER MACHINE CO.

1933 E. Wayne St. Fort Wayne, Ind.

Traffic and Transportation

PROPOSED RATE CHANGES—The following are the latest proposed changes in freight rates up to and including the week of September 14:

Central

62717. **Limestone, agricultural,** unburned, in bulk, C. L. Establish on, from Greencastle and Limedale, Ind., to Greenup, Ill., 66c; Jewett, Montrose, Teutopolis, Effingham, Ill., 77c; Dexter, Altamount, St. Elmo, Avena, Brownstown, Ill., 88c; Vandalia, Ill., 99c; Arcola, Chesterville, Arthur, Fairbanks, Ill., 77c; Williamsburg, Lovington, Ulrich, Lake City, Prairie Hall, Hervey City, Mt. Zion, Turpin and Suffern, Ill., 88c per net ton.

62723. **Sand, gravel** and **crushed stone,** C. L. (See Note 3). Establish on, from Logansport, Lake Ciecott, Kenneth, Winona Lake, Wolcottville, Ind., to Liverpool, Ind., 60c; Hartsdale, Ind., 55c per net ton.

62724. **Sand** (except industrial) and **gravel,** C. L., in open top cars. Establish on, from Irving, N. Y., to Alfred, Cohocton and Horneil, N. Y., 143c per net ton.

62725. (a) **Limestone,** unburned, agricultural, in bulk or in bags, in box cars, C. L., min. wt. 60,000 lb. (b) **Limestone,** agricultural, in bulk, in open top cars, C. L. (See Note 3). Establish on, from Genoa, Ohio, to St. Clair, Mich. (a) 165c and (b) 149c per net ton.

62727. **Industrial sand** as per descriptions (a), (b) and (c). Establish on, from Valparaiso and Wanatah, Ind., to Chicago, Ill., and Gary, Ind. (a) 121c; (b) 133c, and (c) 94c per net ton. Route—Subject to routing guide of origin carriers.

62729. (a) **Sand** (except industrial), and **gravel** in open top equipment, C. L. (See Note 6). (b) **Sand,** in all kinds of equipment, C. L.; **sand** (except industrial), and gravel, in closed equipment, C. L. Establish on, from Chardon, Ohio. Proposed rates (in cents per net ton): To Albany, N. Y., (a) 308, (b) 308; Bradford, Penn., (a) 176, (b) 198; Elmira, N. Y., (a) 253, (b) 253; Johnstown, Penn., (a) 176, (b) 198; Oil City, Penn., (a) 143; (b) 165; Olean, N. Y., (a) 176, (b) 198; Painted Post, N. Y., (a) 237; (b) 242; Rochester, N. Y., (a) 204, (b) 220; Syracuse, N. Y., (a) 253, (b) 253; Troy, N. Y., (a) 319, (b) 319; Watervliet, N. Y., (a) 319, (b) 319; Zelienople, N. Y., (a) 110, (b) 154.

62758. **Stone, crushed, slag** or **gravel,** coated with oil, tar or asphaltum (see Note 7), in open top cars, in straight or mixed C. L. (See Note 3). Establish on, from Detroit, Mich., to Mt. Pleasant, Mich., 194c, and Dundee, Mich., 131c per net ton.

62827 (2). **Slag, ganulated** or **lump,** in bulk, C. L. (See Note 1), except when car is loaded to cubical or visible capacity, actual weight will apply. Establish on, from Ashland, Ky., to New Lexington, O., 138c net ton, via C. & O. Ry., Lancaster, O., P. R. R. and via C. & O. Ry., Charleston, W. Va., N. Y. C. R. R.

62920. **Stone,** viz.: **Quarry scrap, rip rap, rough** (not dimension), **rubble and spauls,** C. L., min. wt. as per B. & L. E. R. R. Trf. I. C. C. 1125. Establish on, from Heinlein and Greenville, Penn., to Pittsburgh, Penn., 153c net ton.

62921 (2). **Stone, crushed; slag, gravel or sand,** coated with oil, tar or asphaltum (See Note 1), in open top equipment, C. L. Establish on, from Parkersburg, W. Va., to following points in West Virginia: Belleville, 80; Pleasant View, 91; Reedy, 102; Spencer, 113; Mason City, 113; Point Pleasant, 113; Glenwood, 124; Huntington, 135; Maxon, 91; Veto, 102; Archer, 124; New Martinsville, 102; Eaton,

---

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason: No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.

★

YOUR COPY IS READY

Q-82

34 JOB PHOTOGRAPHS

The new Barber-Greene Bucket Loader Catalog 82 shows 34 photos of B-G Loaders saving time and money on different types of work including: truck loading from stock piles, road shoulder cleanup, top soil stripping, reclaiming, screening, loading scarified base, etc. Also specifications and accessories. Write for your copy.

BARBER GREENE
AURORA ILLINOIS

IF IN DOUBT AS TO WHO MAKES ANY PARTICULAR PIECE OF EQUIPMENT LET US HELP YOU

We maintain a complete file of manufacturers' catalogs and shall be happy to answer any questions pertaining to machinery, equipment or supplies.

If you have a production problem write us full details and we will tell you how other plant operators have solved it or offer you our suggestions. Our editors are all experienced engineers and have helped solve countless problems in every section of the world. We welcome your inquiries.

ROCK PRODUCTS
309 WEST JACKSON BLVD.
CHICAGO, ILL.

The above screening plant turns out 400 tons of graded aggregate per day and is kept supplied with raw material from a gravel bar by a ¾ cu. yd. Sauerman Slackline Cableway powered by a 40 hp. motor.

●

SAUERMAN Power Drag Scrapers and Cableway Excavators will move from 10 to 1000 cu. yds. per hour over 100 to 1500 ft. spans.

●

Bucket capacities 1/3 to 15 cu. yards.

SAUERMAN efficiency means greater economy and higher PROFITS!

Excavating and stock piling is no problem —can be handled with a minimum of expense and inconvenience, if you'll apply the efficiency of a SAUERMAN Machine to every long range materials handling job.

These machines dig, haul and dump in one economical straight-line operation. Readily adaptable to varying digging conditions, they will move a given yardage in less time than any other machines. Because they require but a single operator, consume little power in operation, and require practically no maintenance, they are extremely inexpensive to operate.

Write for Catalog.

SAUERMAN BROS., Inc.
430 S. Clinton St. Chicago, Ill., U. S. A.

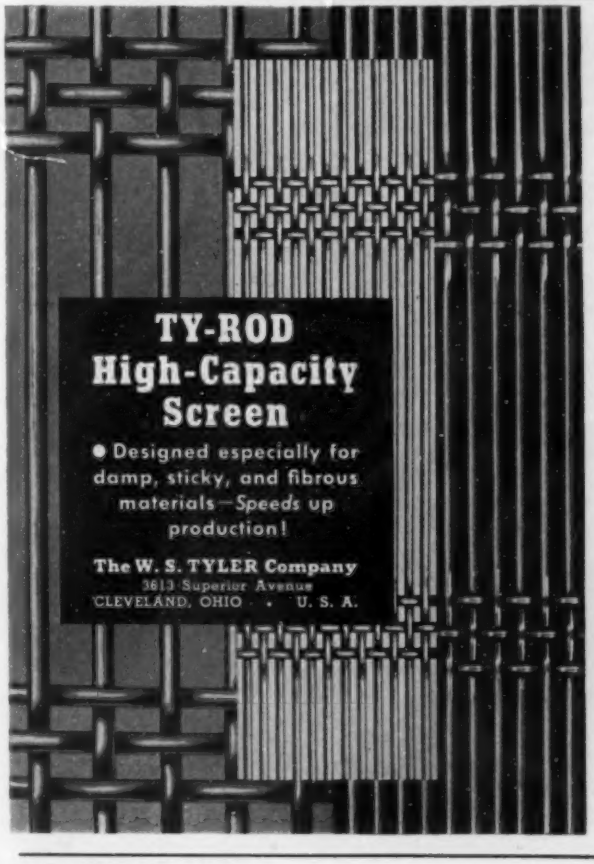
CUTS COSTS!

Ohio gravel firm separates sand from gravel right at diggings with a LINK-BELT VIBRATING SCREEN

● The Massillon Washed Gravel Co., Navarre, Ohio, has found how to cut costs with a Link-Belt vibrating screen. By setting up a plant right at the diggings with a vibrating screen for separating the sand from the gravel, they have reduced the cost of transporting to the main plant —a mile away—where the gravel is graded. For two years this Link-Belt Screen has been giving great service. Operating 12 hours a day, it handles 100 tons of sand and gravel every hour with practically no maintenance expense. If you have a screening problem—write for complete information on Link-Belt vibrating screens. Ask for Book 1762.

LINK-BELT COMPANY
Philadelphia, Chicago, Indianapolis, Atlanta, Dallas, San Francisco, Toronto. Offices and warehouses located in principal cities. 1271

LINK-BELT *Vibrating* **SCREENS**



TY-ROD High-Capacity Screen

● Designed especially for damp, sticky, and fibrous materials—Speeds up production!

The W. S. TYLER Company
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AMERICAN CRUSHERS

Will Cut Your Crushing Cost

Plant managers everywhere report lower crushing costs with an AMERICAN on the job. Years of experience have proven their sturdiness and ability to stand up under the most severe operating conditions, turning out uniform products with minimum upkeep and lower power requirements.

It's easy to install an AMERICAN in your plant to produce those extra products which mean extra profits for you. It will soon pay for itself and then make money for you.

Send us your inquiries on how to cut your crushing costs.

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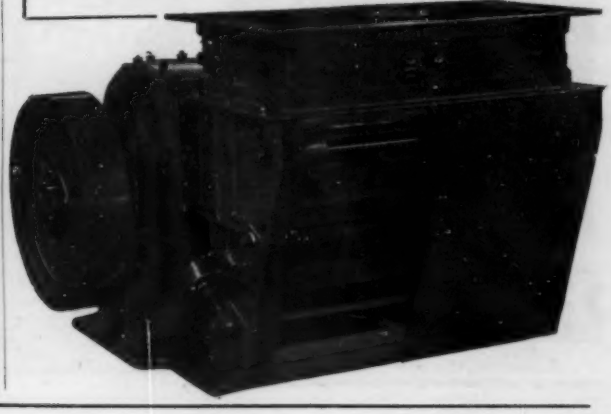

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GRUENDLER EQUIPMENT
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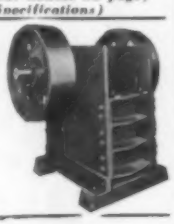
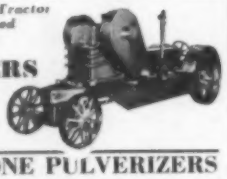
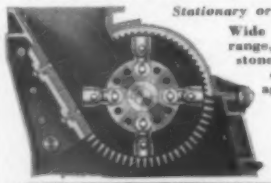
JAW CRUSHERS
Bronze or Roller Bearing
Heavy armor plate steel or cast steel.
Heavy Duty Construction
Large capacity
Small power Requirements



Self Traveling Tractor Self Powered
JAW CRUSHERS
Ideal for maintenance road work



LIMESTONE PULVERIZERS
Stationary or Portable
Wide crushing range, crushes stone to 2½" down to agriculture dust.
Built in 8 Sizes



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H & K PERFORATED METAL SCREENS

MAKE YOUR SCREENING SURFACES MORE EFFECTIVE

By having the perforations properly spaced to give greatest capacity and durability. H & K screens are designed to provide largest amount of open area without loss of strength. Any size, any shape, any metal, any perforation.

Send for illustrated catalog.

The Harrington & King PERFORATING Co.

5650 Fillmore St., Chicago—114 Liberty St., N. Y.

80; Ellenboro, 91; West Union, 102; Clarksburg, 124—to the following Ohio points: Marietta, 80; Waterford (Beverly), 91; Stockport, 102; Malta (McConnellsville), 113; Frosts, 80; Athens, 91; Nelsonville, 119; Gloucester, 119; Corning, 119; Elba, 108; Caldwell, 119.

62932. (a) **Roofing granules (silica),** C. L., min. wt. 60,000 lb. from Copley, Ohio; (b) **granules, roofing,** C. L., min. wt. 60,000 lb., from Phalanx, Ohio. Establish on, rates in cents per net ton as follows: To—North Tonawanda, N. Y. (a) 292, (b) 262; Niagara Falls, N. Y. (a) 292, (b) 262; Lockport, N. Y. (a) 292, (b) 262; Cincinnati, O. (a) 286, (b) 305; Lockland, O. (a) 286, (b) 305; Franklin (Warren Co.) O. (a) 264, (b) 286; Erie, Penn. (a) 225, (b) 196.

62954. **Crushed stone, crushed stone screenings and crushed stone tailings,** in open top cars, C. L. Establish on, from Carey, O., to Howard, O., 110c per net ton via Northern Ohio Ry., New Washington or Chatfield, O., P. R. R.

62957 (2). **Waste stone,** viz.: Breakwater, chips, grout, rip rap and spauls, C. L. Establish on, from points in the Bedford-Bloomington, Ind., stone district, to Muncie, Ind., 145c per net ton. (Proposed rates will not apply interterritorially.)

62987. **Granite, Crushed,** C. L., min. wt. 40,000 lb. Cancel present rate of 277c per net ton on, from Chicago, Ill., to Rushville, Ind., published in Wab. Ry. Trf. I-16505, and similar rate in other individual lines' tariffs, classification basis to apply.

62988. (1). **Sand** (except industrial), in open top or closed equipment, C. L. (See Note 3), but orders will not be accepted for open top cars of less marked capacity than 80,000 lb. Establish on, from Calumet, Crocker, Gary and Willow Creek, Ind., to Sarnia, Ont., 298c net ton, via Wab. Ry., Detroit, Mich., P. M. and via Wab. Ry., Detroit, Mich., Can. Nat'l.

63032. **Crushed stone and crushed stone screenings,** C. L., in open top cars. Establish on, from North Vernon, Ind., to Lapel, Ind., 121c per net ton.

63037 (2). **Sand,** industrial, C. L. Establish on, from Wilmington, Ill., to Benton Harbor, Mich., 165c per net ton, via Alton R. R., Chicago, Ill., P. M. Ry. and via Alton R. R., Joliet or Chicago, Ill.

63077 (2). **Lime (calcium), carbonate of (recarbonated waste),** in packages or in bulk, C. L., min. wt. 50,000 lb. Establish on, from Painesville and Perry, O., to Louisville, Ky., 19c.

63108. **Sand** (other than industrial) **and gravel,** in open top cars, without tarpaulin or other protective covering, C. L. Establish on, from Wells Pit, W. Va., to Confluence, Penn., 143c; Somerfield, Penn., 154c net ton, via B. & O. R. R.

63165. **Industrial sand,** as per usual descriptions (a), (b) and (c). Establish on, from Wolcott, Ind., to Chicago, Ill., and Gary, Ind. (a) 154c; (b) 169c, and (c) 116c per net ton.

63166. **Sand,** C. L. Establish on, from Cleveland, O., to Wilmington, O., 160c per net ton. (Applies in open top cars.)

63171. **Vermiculite,** calcined or roasted, C. L., min. wt. 40,000 lb. Establish on, from E. St. Louis, Ill., to Baltimore, Md., 38c. (Applicable only on shipments originating at Encampment, Wyo.).

63176 (2). **Sand** (except industrial) **and gravel,** C. L., in open-top cars (See Note 3). Establish on, from Irving, N. Y., to Corning, N. Y., 154c per net ton, viz., N. Y. C. (W)—N. Y. C. (E) direct.

63178. **Stone, crushed, slag and gravel,** coated with oil, tar or asphaltum (See Note 7), in open top equipment, C. L. Establish on, from Benwood, W. Va., to the following points: (Rates in cents per net ton): Rowlesburg, W. Va., 146; Grafton, W. Va., 135; Clarksburg, W. Va., 135; Lost Creek, W. Va., 146; Salem, W. Va., 146; Pennsboro, W. Va., 157; Parkersburg, W. Va., 135; Burton, W. Va., 102; Littleton, W. Va., 91; Moundsville, W. Va., 80; New Martinsville, W. Va., 91; Pine Grove, W. Va., 102; Lumberport, W. Va., 135; Paden City, W. Va., 91; Sistersville, W. Va., 102; Ravenswood, W. Va., 146; Massilon, O., 124; New Philadelphia, O., 113; Uhrichsville, O., 113; Piedmont, O., 102; Lafferty, O., 91; St. Clairsville, O., 80; Finleyville, Pa., 102; Elm Grove, W. Va., 80; Newark, O., 135; Zanesville, O., 113; Cambridge, O., 102; Bethesda, O., 91; Belmont, O., 80; Cumberland, O., 113; Eagleport, O., 124; Roxbury, O., 135; Waterford, O., 146; Marietta, O., 135; Belpre, O., 124.

63190. **Lime, agricultural, common, hydrated, quick, slaked or fibred,** C. L. Establish on, from Buffalo, N. Y., to Marblehead, O., 17c, min. wt. 30,000 lb.; 14c, min. wt. 50,000 lb.

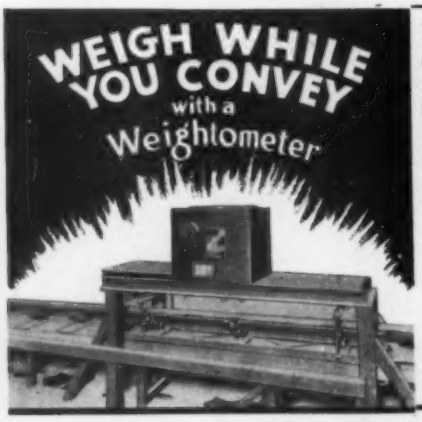
63197. **Limestone,** ground or crushed, unburnt, C. L., min. wt. 60,000 lb. Establish on, from Marlo, Mosher and Ste. Genevieve, Mo., to Washington, D. C., 501c; Baltimore, Md., 523c; Harrisonburg, Va., 468c per net ton.

63392. **Industrial sand,** as per usual Descriptions (a), (b) and (c). Establish on from Wolcott, Ind., to Muncie, Ind. (a) 165c; (b) 182c; (c) 127c per net ton.

63393. **Sand,** industrial. Establish rate of 534c in open top cars and 556c per net ton in closed cars from Henlein, Penn., to Smith Falls, Ont.

Trunk

Sup. 2 to 38963. **Limestone,** crude, fluxing, foundry and furnace, C. L. (See Note 3), from Swatara, Palmyra, Myerstown and Annville, Penn., to Florence and Burlington, N. J., 174c per gross ton;



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MERRICK SCALE MFG. CO.
188 AUTUMN ST. PASSAIC, N. J.

and from Grove, Md., Engle, Martinsburg, W. Va., Stephens City, Capon Road and Strasburg Junction, Va., to Burlington, Florence, Roebling and Trenton, N. J., 208c per gross ton.

Sup. 1 to 38963. **Limestone,** crude, fluxing, foundry and furnace, C. L. (See Note 3), from Bittinger, Thomasville and York, Penn., to Florence and Burlington, N. J., 174c per gross ton.

39024 (shippers). **Sand** (other than industrial), in open cars without tarpaulin or other protective covering. **Sand** (other than industrial), in closed cars or in open cars with tarpaulin or other protective covering. **Sand,** industrial, in open top or closed cars (will not apply on sand processed beyond washing or screening for decolorizing filtering or water softening) (See Note 3), from Allegany, Carrollton, Irvine Mills, Limestone, Olean and Vandalia, N. Y., to Crawfordsville, Ind., 341c per net ton (See Note 6).

39051. **Limestone, crude, fluxing, foundry and furnace,** C. L., when shipped in open top equipment (See Note 3), from Naginey, Penn., to Neville Island, Penn., 116c per gross ton, in lieu of current sixth class rate of 22c per 100 lb. (See Note 5).

39077. **Calcium of lime,** carbonate of, N. O. I. B. N. in O. C., C. L., min. wt. 40,000 lb., from Covington, Va., to Newport News, Va. (Note A), 21c per 100 lb., in lieu of current Class 22½ rate of 22c per 100 lb. Note A: Where reference is made to this note, rates will apply on intercoastal traffic, i.e., traffic destined to points on the Pacific Coast of United States, Alaska and British Columbia moving via the Panama Canal. Reason: Comparable with rate applying to other ports.

39103. **Sand,** moulding (naturally bonded), C. L., from Albany, Aqueduct, Catskill, Coxsackie, Crescent, Feura Bush, Fullers, Glenmont, Stuyvesant, Green Island, Guilderland Center, Karner, New Hamburgh, Niskayuna, Rhinecliff, Selkirk, Schenectady, So. Schenectady, Troy, Voorheesville, Wemple and West Albany, N. Y., to Athol, Mass., 209c per net ton, in lieu of current 6th class rate (See Note 5).

Western

E-41-409. **Moulding sand,** C. L., from Dousman, Wis., to South Bend, Ind. Rates: Present—220c per net ton (intermediate to Merrimac, Wis., per Item 245 of W. T. L. Tariff 41-Z). Proposed—198c per net ton.

Sup. 1 to E-41-406. **Stone,** crushed. (See Note 3), but not less than 40,000 lb., from Dell Rapids, S. D., to Alta Vista, Ia. Rates, present 242c net ton (combination rate). Proposed, 210c.

E-43-95. **Stone, flux,** C. L. From Knowles, Wis., to Waukegan, Ill. Rates: Present—7.5c per 100 lb. proposed—class rates.

E-111-16. **Mineral wool** (rock or slag wool), metal reinforced, in boxes or crates, C. L. Min. wt. 30,000 lb., subject to Rule 34 of Official Classification. Mineral wool (rock or slag wool), plain or saturated; batts, with or without paper backing or wrapping; other than batts, C. L. Min. wt. 24,000 lb., subject to Rule 34 of Official Classification. From Alexandria, Ind. To Beaver Dam, Wis. Rates: Present 39c per 100 lb. Proposed—31c per 100 lb.

Southwestern

20287. **Granules, roofing** (chat sand), Picher, Okla., to Chicago, Ill., Port Neches, Tex., Dallas, Tex., St. Louis, Mo., New Orleans, La., and Shreveport, La. Establish specific commodity rates in cents per ton of 2,000 lb. on, from Picher, Okla., to Chicago, Ill., $3.00. Dallas, Tex., $2.00, New Orleans, La., $3.25. Port Neches, Tex., $3.00, St. Louis, Mo., $2.00, and Shreveport, La., $2.25.

20828. **Chat sand.** Establish rate of $3.10 per ton on C. L., min. wt. 100,000 lb. from Webb City, Joplin, Waco, Carter, Mo., Galena, Kan., and Picher, Okla., to Russellville, Ala., and Rockwood, Ala., except when from Picher Okla., and Carter, Mo., rate to Rockwood, Ala., will be $3.20 per net ton.

20830. **Roofing granules.** To establish rate of $8.20 per ton of 2000 lb. on C. L., as described in Item 1700 of S. W. L. Tariff 58V (See Note 2), from Poultney, Vt., Castleton, Vt., Granville, N. Y., and Middle Granville, N. Y., to Fort Worth and Dallas, Tex.

20930 (1). **Sand,** crude, silica. Establish rate of 418c per ton on sand, crude silica (that which will pass through a 120 mesh screen, and so indicated by shipper on bill of lading), C. L., minimum weight 60,000 lb. from Seneca, Racine, Mo., and Rogers, Ark., to Birmingham, Ala.

Southern

Amdt. 1 to 22322. This submittal included in Dkt. 1043, amended to suggest 235c net ton on **crushed, broken or rip rap stone,** C. L., from Knoxville and Mascot, Tenn., to Port St. Joe, Fla., instead of 240c net ton.

22347. **Sand and gravel,** C. L. Establish 88c net ton—Hattiesburg, Miss., to New Orleans, La.

23107. **Gravel,** C. L. Establish from Chattahoochee River, Fla., to Ft. Lauderdale, Fla., 205c; South Bay, Fla., 210c; Eau Gallie, and Melbourne, Fla., 190c net ton. Water competitive.

23263. **Lime,** C. L., min. 70,000 lb. Establish 145c net ton—Pelham, Ala., to Alabama City, Ala. Truck competitive. Expires June 30, 1941.

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Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

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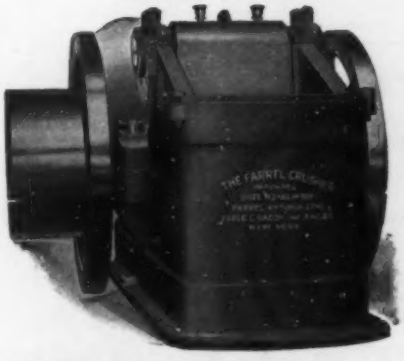

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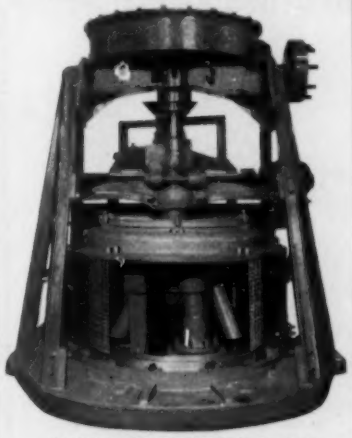

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GYRATING SCREENS have made a remarkable record of real service when compared with competitive equipment under actual operating conditions.

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Simplicity

ENGINEERING COMPANY
DURAND, MICHIGAN

OBITUARIES

MAJOR FREDERICK H. LEWIS, one of the directors of Volunteer Portland Cement Co., died August 31 in Charlottesville, Va., at the age of 82. For a time after graduation from the University of Pennsylvania he was a railroad and consulting engineer. Becoming interested in the manufacture of portland cement, he studied the industry here and in Europe. He acted as a consulting engineer and directed construction of the plant at Leeds, Ala., now owned and operated by Universal Atlas Cement Co. In 1927 he was the engineer of construction for the Volunteer Portland Cement Co. plant at Knoxville. His son, Major Charles F. Lewis, is manager of the company.

•

J. C. MCCLAIN, president and one of the founders of the McClain Sand Co., Point Marion, Penn., died September 9 at the age of 74.

•

EDWARD B. GOODE, JR., retired sales manager of Hercules Cement Corp., New York City, died August 22. He was 66 years of age.

•

JOHN AVERY, 69, for 25 years a field engineer for the Portland Cement Association, died at his Yonkers, N. Y., home September 9.

•

RICHARD HAMMERSCHMIDT, president and general manager of the Elmhurst-Chicago Stone Co., Elmhurst, Ill., died August 25.

•

NORMAN MACBETH, vice-president of the Riverside Cement Co., Los Angeles, Calif., died September 5, at the age of 61.

•

T. F. CULBERTSON, superintendent of the Ash Grove Lime and Portland Cement Co. plant at Ash Grove until it moved to Galloway in 1932, died recently. He was 67 years of age. After the Ash Grove company moved its plant to Galloway he remained in Ash Grove to look after property still maintained there.

•

CLAUDE A. WEBB, former sales executive of Universal Atlas Cement Co., and recently Chicago sales representative of the Wolverine Cement Co., died recently.

Review of Nonmetallic Industries Available

BUREAU OF MINES, Washington, D. C., announces that Information Circular 7106 "Nonmetallic Mineral Industries in 1939" prepared by Paul M. Tyler and Oliver Bowles is now available. It summarizes progress in the entire rock products industry. Copies are available upon written request.

To Produce Limestone Products

CAL-BURT-BRAND CALCIUM PRODUCTS Co., Colton, Calif., has been organized to manufacture water softeners, kitchen cleansers, fertilizers, etc. The company owns a limestone mine at Kingston, Calif. C. A. Burt is president of the company; H. B. Leavitt, sales and production manager; A. R. Hazeltine, treasurer; and Mrs. Edna Bristow, secretary.

Handy Book For Employment Records

UNIVERSAL ATLAS CEMENT CO., New York, N. Y., has available, free for the asking, a "Time Book," which contains space for job, office, social security and wage records, either for field use or office use. It also contains a summary of legislative laws of importance. Copies may be had by writing the company offices at 135 East 42nd St., New York, N. Y.

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for SHOVELS DREDGES CRANES CONVEYORS

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Established 1881 CARLISLE, PA.

PRICES BID
Contracts Let

YAKIMA, WASH.: With a bid of $1.20 a ton, L. C. Curtis & Sons of Kettle Falls was low among six bidders for the contract to supply 19,600 tons of sand and gravel for construction work on the main canal and one wasteway for the Roza project.

•

BENNINGTON, VT.: Israel LaFlamme was awarded a contract to furnish the village street department crushed stone when needed at $1.50 per cu. yd.

•

CALDWELL, OHIO: The Noble county commissioners have let contracts for stone to be used on three different highways in the county. William Dimmerling was awarded 1200 cu. yd. of crushed limestone at 74c per cu. yd.; David Betts got a contract for 1000 cu. yd. of limestone with a bid of 95c per cu. yd.; and Lawrence King was awarded a contract for 1000 cu. yd. at 82c per cu. yd.

•

OKLAHOMA CITY, OKLA.: Ada Lime Co., Ada, Okla., submitted a bid of $7.35 a ton on 4000 tons of lime to be used at the water purification plant. Southwest Building Material Co. bid $7.20 a ton. This was low but was irregularly filed. Other bids were: Midwest Chemical Co., $7.70; Thompson Hayward Chemical Co., $9.25; Ash Grove Lime and Portland Cement Co., $10.60; Mississippi Lime Co., $9.80 and the Dunlap Co., $8.25.

•

FT. WAYNE, IND.: Contracts for 36,000 tons of coarse aggregate stone and gravel for use by the county highway department were awarded as follows: Ray Irving, St. Joe road, $1.57 per ton, Hassler road, $1.63, Paulding road, $1.47, and St. Joe Center road, $1.60; J. C. O'Connor, Paulding road, $1.55, and Bass road, $1.55; Erie Stone Co., lower Huntington road, $1.50, Maysville road, $1.60, Yellow River road, $1.60, and Washington Center road, $1.60; Northern Indiana Sand & Gravel Co., Leesburg road, $1.65, and Carroll road, $1.70; and Mershberger Stone Co., Minnich road, $1.60.

•

ROCK ISLAND, ILL.: Western Sand and Gravel Co., Spring Valley, was given the order for 2214 cu. yd. of gravel for a road improvement project when it submitted the low bid of $1.568 a cu. yd.

•

SANDUSKY, OHIO: The price for agricultural limestone at the quarry, under grant of aid, is 85c per ton. The price delivered and spread varies from $1.25 to $2.10 a ton.

•

LISBON, OHIO: County commissioners have awarded a contract to the Carbon Limestone Co., Youngstown, for 535 tons of No. 7 crushed stone at $1.28 per ton and a contract to the Standard Slag Co., Youngstown, for 2273 tons of bank slag at $1.31 per ton.

•

BRANSON, MO.: Independent Gravel Co., Joplin, Mo., will furnish agricultural limestone under the "grant of aid" plan at $1.15 per ton f.o.b. quarry, and Moore & Lewis, Hollister, Mo., will furnish agricultural limestone at $1.50 f.o.b. quarry and $2.00 delivered at the farm.

•

OWENSVILLE, MO.: Harvey Pietraschke has been awarded the contract to crush and deliver limestone under the Federal Grant of Aid Program to farmers in nearby townships of Gasconade County. The limestone will be delivered at $1.35 per ton and delivered and spread at $1.65.

Made of Acid Open Hearth Steel Wire

Round Strand
Flattened Strand
Preformed
Steel Clad
Non-Rotating

The Service Record of this wire rope continues to make and hold friends.

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RACINE - - WISCONSIN

New Incorporations

Armstrong-McLeod Gravel and Towing Co., Ltd., Vancouver, B. C., has been incorporated with a capital of $25,000.

Detroit Lime & Chemical Corp., Detroit, Mich., has been granted a charter with a capital of $150,000 in common stock.

Vacuum Concrete Co. of Ohio, Cincinnati, has been incorporated by Milton H. Schmidt, Harry Kasfir and Donald Fischer for $25,000.

Mineral Ridge Fluorspar Co., Livingston County, Ky., with a capital of $100,000, has been incorporated by C. C. Grassham, Fred S. Lash, G. Dickey and E. Palmer James.

Manufacturers' News Notes

R. C. Stanhope, Inc., and its affiliate, **Tidewater Equipment and Machinery Corp.**, have moved into larger quarters at the Lincoln Building, 60 East 42nd Street, New York City.

The Falk Corp., Milwaukee, announces the appointment of J. A. Butler as comptroller.

Ransome Concrete Machinery Co., Dunnelen, N. J., has appointed Gerald F. Monaghan advertising manager. He resigned from the sales division of Worthington Pump & Machinery Co. to take over this position.

Allis-Chalmers Mfg. Co., Milwaukee, has promoted Chester H. Norton, purchasing agent at its Boston works to assistant general manager of purchases. He will be succeeded by H. W. Hauser, formerly with the company's purchasing department in Milwaukee.

Marmon-Herrington Co., Inc., Indianapolis, Ind., reports the death of Walter C. Marmon, chairman of the Board of Directors on August 29.

Chicago Pneumatic Tool Co., New York, N. Y., has appointed P. J. Christy manager of their Philadelphia office, to succeed A. M. Brown, who has been transferred to Washington, D. C., as manager of the branch recently opened there. C. A. Diehl has been appointed manager of the Houston, Tex., office.

John A. Roebling's Sons Co., Trenton, N. J., has appointed William P. Laseter as export manager of their new export division to be located at 19 Rector Street, New York City. It is also opening a new branch office and warehouse in Houston, Tex., to be managed by R. A. Hill.

Marion Steam Shovel Co., Marion, Ohio, has appointed D. E. Rizor as manager of the Chicago district to replace John L. Steward, who has resigned.

C. O. Bartlett & Snow Co., Cleveland, Ohio, announces the appointment of C. O. Bartlett as district manager in the Detroit territory. He is the son of the founder and organizer of the company and has had wide experience with the company's equipment and engineering service.

Cleveland Rock Drill Co., Cleveland, Ohio, has appointed Clarence L. Seaman district manager at the branch office in Berkeley, Calif., and Clarence P. Zeuch at Wallace, Idaho. Both these offices have just been established.

Koehring Co., Milwaukee, Wis., announces that after 33 years of service as president, W. J. Koehring has resigned as president and will act as chairman of the board. During this period he has been in charge of production, watching and directing the company's development. G. E. Long, who has acted as treasurer, secretary, sales manager and general manager, succeeds Mr. Koehring as president, and P. Graser has been elected secretary-treasurer.

Nordberg Manufacturing Co., Milwaukee, Wis., announces the appointment of Clinton E. Stryker as vice-president and assistant to the president. He was formerly a partner in McKinsey, Kearney & Co., management engineers of Chicago and prior to that was with Fansteel Metallurgical Corp.

Clinton E. Stryker

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Major crushing by smashing impact,—Automatic Hammer Turning and Resharpening,—Lower Power Demand,—and Sharply cut upkeep cost.

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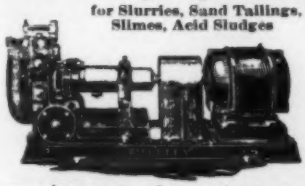
centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges



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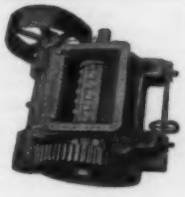

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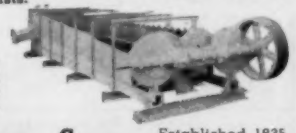
Complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any materials.



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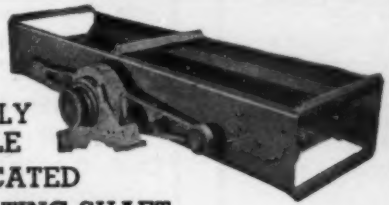

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3. FULL FLOATING SHAFT
4. STURDY CONSTRUCTION

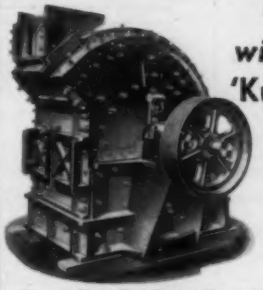
• *Write for "DATA BOOK"*

PRODUCTIVE EQUIPMENT CORP.

2926-28 WEST LAKE STREET CHICAGO, ILLINOIS

PRODUCE BETTER AGGREGATE AT LOWER COST

with the Cedarapids 'Kubit' Impact Breaker



- REDUCES PERCENTAGE OF ELONGATED PIECES.
- PRODUCES ALMOST 100% FRACTURED MATERIAL.
- MAKES SMALLER SIZES WITH LESS WASTE.
- PRODUCES A BETTER GRADATION OF AGGREGATES

Write for Bulletin K-1

Licensed Under U. S. Patent No. 1996485

IOWA MFG. CO. CEDAR RAPIDS, IOWA

Classified Advertisements

CLASSIFIED RATES

POSITIONS WANTED — POSITIONS VACANT—Set in six-point type. Minimum $1.00 each insertion, payable in advance.

INFORMATION—Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED — Displayed or undisplayed. Rate per column inch, $5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

AVAILABLE TODAY! TOMORROW—?

QUICK ACTION NEEDED!

Our liquidation of the CASTALIA PORTLAND CEMENT plant at CASTALIA, OHIO, is nearing a conclusion. These remaining items must be sold immediately. Priced accordingly:

8'x125', 6'x120' and 6'x60' Rotary Kilns.
3—Direct Heat Rotary Dryers—4'6 x 30', double shell; 4' x 60', 6 x 60'.
2—5'x10' Bonnot Ball Mills, steel lining, with motors.
2—5'x22' Tube Mills, silex, with motors.
1—8'x30" Hardinge Conical Ball Mill, iron lined, with motor.
3—5'x27' Tube Mills, silex, with motors.
3—18 ton Steam Locomotives, Vulcan and Porter, 36" ga.
100—1½ yd. two-way Steel Dump Cars, 36" ga.
3500 Horsepower in Electric Motors, all 3/60/440 volt; included are 2—150 H.P. and 6—200 H.P. Slip Ring Motors, 585 RPM.

RAYMOND PULVERIZERS

2 roll and 3 roll High Side—4 and 5 roll Low Side; No.'s 0000, 00, 1 and 2, Beater type—Also No.'s 55, 60, 90 Imp type, also No. 40 Imp with 6" Centrifugal Separator.

CENTRIFUGAL AIR SEPARATORS

10' Sturtevant; 8', 10', 12' Gayco; 6' Raymond; also 5' dia. Raymond "Whizzer" for attachment to roller mill.

HARDINGE CONICAL BALL MILLS

3'x8", 5'x22", 6'x22", 7'x22", 8'x30", 8'x72".

SYMONS CONE CRUSHERS

2 ft. and 7 ft., each with fine bowl.

GYRATORY FINISHING CRUSHERS

1'8" and 2'4" Traylor TY; 410-TZ, 4' Traylor; No. 19, 25, 37 and 49 Kennedy.

GYRATORY CRUSHERS

36" Allis-Chalmers Style "N," short shaft; 30" Allis-Chalmers Superior McCully; 42" Gates; 20" Kennedy Gearless; 20" Traylor; 20" Allis-Chalmers Superior McCully; 15" Telsmith; 13" Superior McCully and smaller sizes.

JAW CRUSHERS

30x42" Buchanan Type "C"; 48x42 Traylor Bull-dog; 66x86 Traylor; 48x60 Traylor; 36x24 Farrel; 18x36 Farrel; 24x36 Allis-Chalmers; 8x36 Universal Roll Jaw; 18x39 Allis-Chalmers and smaller sizes.

ROTARY KILNS

9'x160', 8'x150', 8'x125', 8'x100', 6'x120', 6'x60'.

ROTARY DRYERS—Direct Heat

Ruggles-Coles, double shell; 5'x26', 5'x36', 5'6x60', 80"x45', 104"x60', 104"x85'. Single Shell; 4'x30', 5'x30', 6'x40', 6'x50', 6'x60', 8'x60', 8'8"x85'.

BALL, ROD AND TUBE MILLS

Ball Mills: 3'x5', 5'x10', 6'x8', 6'x8'.
Rod Mills: 4'x8', 6'x12' Hardinge, straight side; 5'x10', 5'x12' Allis-Chalmers.
Tube Mills; 3'x12', 4'x16', 5'x30', 5'x35'.

VIBRATING SCREENS

Allis-Chalmers 5'x10', 3 deck; Stephen-Adamson 4'x8', 2 deck; Tyler Hummer 3'x5', 4'x5' 1 and 2 decks; 4—4'x7' Leahy, two deck; 4'x8' Huron, 1 deck; 3—4'x7' Jeffrey-Traylor, 2 deck; Symons 4'x10' 4'x12' 5'x10' 2 deck. Also Rotex, Robinson and other makes.

LOCOMOTIVES

2—Diesel driven 8-ton, 36" ga. Locomotives, D-4400 Diesel motors.
2—Diesel driven 4½ ton 36" ga. Locomotives, Buda Lanova motors.
3—18 ton Steam Locomotives, Vulcan and Porter, 36" ga. Near Cleveland, Ohio.
2—Plymouth Std. Ga. Gasoline 20 ton and 24 ton Locomotives.

SHOVELS AND CRANES

1—2 yd. Lima Shovel, Model 850, with Caterpillar Diesel D-17,000 Engine. 1937.
1—1½ yd. Lorain Shovel "79," double chain drive, Caterpillar trucks, D-13,000 Caterpillar Diesel Engine. Built late 1939.
1—2 yd. Marion, No. 38, Comb. Shovel and Crane, Buda Diesel. 1937.
1—No. 37B 1½ yd. Bucyrus-Erie Dragline, new 1939. Caterpillar Diesel motor.
1—Bucyrus-Erie 48-B, Diesel driven Shovel, 2 yd. 1937.
1—Northwest 2½ yd. Diesel driven Shovel, full revolving, 1937.
1—19-B Bucyrus Erie Gasoline Shovel, ⅝ yd. 1939.
1—Bucyrus-Erie 2 yd. 50-B steam driven Dragline Crane, and Shovel. Aluminum dragline boom and little used shovel front.
1—Truck Crane "Universal" 7½ ton.

AIR COMPRESSORS

2—Sullivan Type WN-102, two stage, 550'. New 1939.
2—Ingersoll-Rand 90-CH, two stage, air cooled, electric driven, on skids, 360 CFM, 1939.
1—Ingersoll-Rand 315-A Portable.
2—Ingersoll-Rand 830 cu. ft. air cooled, electric driven, 100 lbs., 1939.
1—Chicago Pneumatic OCE 20x12x14; synchronous motor.

CONSOLIDATED PRODUCTS CO., Inc. 15-16-17 Park Row, New York, N. Y.

Our Shops at Newark, N. J., cover eight acres

USED SPEED REDUCERS

All Sizes - Types - Makes
Conveying Equipment

SAVE 60% OF NEW COSTS

All Materials Overhauled, Guaranteed
SEND FOR OUR STOCK LISTS

Patron Transmission Co.
154 GRAND ST. NEW YORK

Used Equipment for Sale

12'x12'x20' high oversize hopper, sloping grizzly
20' and 32' bucket elevators
30"x10'x9" shaker screen
Model No. U-40 Allis Chalmers engine
4" Sterling sand pump No. 3558
60"x20' Revolving screen—structural frame, portable
10"x20"—10"x36" and 15"x36" DIAMOND Roller Bearing Jaw Crushers

New Equipment

9"x16" DIAMOND crusher—truck mounted with engine
No. 20 Diamond portable crushing and screening plant
2—10"x20" portable crushing and elevating plants
Special prices for quick sales

DIAMOND IRON WORKS, INC., AND MAHR MANUFACTURING COMPANY DIV.
MINNEAPOLIS, MINNESOTA

REAL TRUCK MIXER BARGAINS

Seven Jaeger 1½-2 yd. Truck Mixers mounted on Model EH "Baby Mack" trucks. Used less than 2 seasons; replaced with larger units. In excellent condition, ready to work. Will sell separate or on trucks, at tremendous saving in price.

Write or Wire for Details

J. C. LEMBO
c/o The Jaeger Machine Co.
COLUMBUS, OHIO

Quarrying and Stone Working Equipment and Machinery FOR SALE

(from the former Frank T. Lang Quarries, Addison, Maine)

1—STEEL ASBESTOS (TRANSITE) BUILDING 140' x 102' with Electric Travelling Crane 72' span; 10 tons cap.
15—ELECTR. AND AIR DRIVEN HOISTS, single and double drum.
10—DERRICKS; 40' to 80'; cap. 20 to 40 tons
3—AIR COMPRESSORS, single and double stage
4—AIR DRILLS (two with quarry bars)
Stone Working Machines (such as Gang Saw, Carborundum Machine, Polishing Machines, Surfacing Machines), Complete Woodworking Shop; Motors; Pumps; and a great variety of Miscellaneous Items.

ASSOCIATED METALS & MINERALS CORP.
40 Rector Street, New York, N. Y.

FOR SALE

KILNS:—6' x 36', 8' x 125', 8' x 150', 9' x 160'.
DRYERS:—3'6" x 24', 5' x 40', 5' x 50'.
BALL MILLS:—5' x 8', 6' x 8', 5' x 22', 5' x 22", 8' x 30".
HARDINGE MILLS:—4½' x 16", 6' x 22", 5' x 22", 8' x 30".
RAYMOND MILLS:—No. 0000, 00, 1, 3, 3 roll, No. 55 Imp.
HAMMER MILLS:—Jeffrey 30" x 24", Williams, Gruendler, etc.
MISCELLANEOUS:—4—100 HP Boilers, Bucket Elevators, lime Kilns, pipe, Tanks, etc., located New Mexico, send for bulletin.

BRILL Equipment Corporation
183 Varick St., N. Y. C.

Cars You Have Been Looking For!

90 to 100

Clark G-6, *30-Yard* 50-Ton Air Dump Cars, *down-turning door* type.

Extra heavily constructed. Floor Plates ½" Steel Wheels.

Cheaply priced. Act before too late!

IRON & STEEL PRODUCTS, INC.
13492 S. Brainard Avenue
Chicago, Illinois

***"Anything* containing IRON or STEEL"**

"WE BUY, REBUILD, SELL OR RENT"

AIR COMPRESSORS
Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

BINS
9—2 compartment bins; 2—118 ton Blaw Knox; 1—75 ton Butler V-40; 3—72 ton Blaw Knox; 1—60 ton Butler V-40; 1—35 ton Blaw Knox portable; 1—36 ton Heltzel portable with Kron dial scale. All above with or without volume or weigh batchers.

BUCKETS
26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.
6—Dragline: 1—1⅝ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2—1 yd. Hayward; 1—⅝ yd. Page.
1—1½ yd. Pioneer Cableway Excavator bucket.
7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—⅝ yd. Garst; 2—½ yd. Garst.

CRANES, DRAGLINES and SHOVELS
1—Link-Belt, K-55, Serial No. 1698, 70' boom, 2 yd. bucket, also have 2 yd. shovel attachment.
1—Link-Belt, K-45, Speedomatic, Caterpillar Diesel 13000 with 50' boom and 2 yd. dragline bucket.
1—Bucyrus Erie 1½ yd., 33-B, A.C. electric tunnel shovel.
1—Northwest Model 104, Serial No. 2079, 45' boom, 1½ yd. bucket; with 1 yd. shovel attachment.

SPECIAL
1—Blaw-Knox 120 ton lev. cap. 4 compartment steel bin with extra 100 barrel cement compartment dial scale for weighing 1½ yd. batch and separate dial scale for weighing bulk cement, complete with Fairbanks-Morse water weighing device.

1—Industrial Brownhoist Model D.C., 15-ton cap. with 40' boom.
1—Link-Belt Model K-42, Serial No. 1285, 45' boom, 1¼ yd. bucket, also 1 yd. trench hoe attachment or 1¼ yd. shovel front.
2—Northwest Model 105, Serial No. 2053, 1645, 40' boom, 1 yd. bucket.
2—Osgood Heavy Duty, Serial No. 2060 and 2087, 40' boom, 1 yd. bucket and with 1 yd. shovel attachment.
2—Thew ⅝ yd. Gasoline Shovel with ⅝ yd. shovel front and 40' crane boom. Serial No. 2687 and No. 2801.
1—P&H, ⅝ yd. Gasoline Crane with 40' boom. Serial No. 1834.
1—Koehring Model 301, Serial No. 544, 40' boom ⅝ yd. bucket.
1—Lorain ⅝ yd. shovel, Model 79, close couple bail with reversible dipper teeth, powered by 75 HP 440-60-3 motor.
1—Bucyrus Erie ⅝ yd., Model 1039, combination.
1—Northwest No. 2 crane, new 1937 with 40' boom.
1—Byers Bearcat Model 27, Serial No. 5289, 30' boom, ½ cl. sw., ½ yd. bucket.
1—Erie Steam Crane Shovel with 40' crane boom, with or without ⅝ yd. shovel front.
1—Universal Model 25, 50' boom, ½ yd. bucket.
1—Norberg Butler caterpillar mounted tunnel shovel, air driven. Model 110, shop 2168.
1—Conway Mucker type 60, 60 HP, 440-60-3 electric motor with belt boom and bucket.

CRUSHERS
5—Gyratory crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin; 1—No. 5 Gates; 1—No. 3 McCully; 1—No. 0 McCully.
10—Jaw Crushers: 3—15x36" Universal; 1—15x36" Cedar Rapids; 1—15x28" Champion; 1—12x20" Acme; 3—10x20" Climax No. 2½; 1—9x16" Telsmith No. 9A; 1—9x15" Champion.
1—Set of Allis-Chalmers, smooth type crushing rolls, 42x16".

DREDGE PUMPS
1—12" Morris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.
3—Belt Driven: 3—Morris Mang., 1—10", 1—8", 1—6".

HOISTS
1—2 Yd. Thomas 2 speed Class L Cableway excavator hoist with 150 HP electric motor.
1—National 50 HP dragscraper hoist for handling 1 yd. bucket with 50 HP electric or gas power.
1—1 Yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.
1—1 Yd. Kern variable speed dragscraper hoist powered by 50 HP electric motor.

PNEUMATIC TOOLS
4—Ingersoll-Rand & Gardner Denver Wagon Drills with 1-Bx72 or Gardner Denver Mod. 21 Drills and air hoists.
53—Jackhammer drills: I.R. DCR-23 & S-49 and Gardner Denver, Mod. 37 & 11-D.
17—Drifters, column mounted: 7, Sullivan TJ-10; 4—Gardner Denver Mod. 17; 6—I.R. 72.
3—Drill sharpeners: 2—Sullivan late Mod. Class C and Class A; 1—I.R. 50.

PLEASE SEND FOR A COMPLETE STOCK LIST

EQUIPMENT CORPORATION OF AMERICA

PHILADELPHIA—1506 Race St. Phone: Rittenhouse 4664
CHICAGO—1119 So. Washtenaw Ave. Phone Nevada 2400
PITTSBURGH—P. O. Box 933. Phone Federal 2000

LOCOMOTIVES SHOVELS — CRANES

Attractive Prices

1—80 Ton American 0-6-0 Switcher.
1—75 Ton Baldwin 0-6-0 Switcher.
2—40 Ton American Saddle Tanks.
1—38 Ton Vulcan Saddle Tank.
1—38 Ton Porter Saddle Tank.
2—25 Ton Plymouth—Gasoline. Standard Gauge—Rebuilt

1—Marion 480 Combination Steam Shovel and Crane.
1—52-B Bucyrus Dragline 70 ft. Boom, Atlas Imperial Diesel Engine.
1—25 Ton Browning 8-C Steam Locomotive Crane.

Birmingham Rail & Locomotive Co.
BIRMINGHAM, ALA.

24" x 36" Traylor Jaw Crusher
24" x 36" Farrell Jaw Crusher
18" x 36" Farrell Jaw Crusher
18" x 36" Buchanan Jaw Crusher
20" Traylor Gyratory Crusher
2'4" Traylor Gyratory Crusher
10-20 Good Roads Roller Bearing Jaw Crusher
Jeffery Hammer Mill
495' of New 36" 7 Ply Conveyor Belt
No. 79 Lorain Shovel

BLUE BALL MACHINE WORKS
BLUE BALL PENNA.

TRUCK MIXER FLEET READY TO GO

2—3½ yd. Rex separate engine drive mixers, 1937, mounted on V-8 Ford Thornton drive trucks.
8—3 yard Jaeger truck mixers mounted on AK Mack trucks now operating.
2—1½-2 yd. Jaeger Truck Mixers on DeLuxe model Fords—very good condition—ready to go—excellent buy.
15—4 yd. Jaegers on AK Macks—now operating, and—3—3 yd. Blaw-Knox on BF Macks—now operating.
3—4 yd. Rex Moto-Mixers on 1938 Autocar Trucks—Mixers new 1938—now working.
4—4 yd. Rex Moto-Mixers on AC Mack Trucks—Mixers new 1937—now working.
2—1½-2 yd. Jaeger—Separate Engine drive mounted on G.M.C. Trucks.
1—3 yd. Blaw-Knox Truck Mixer—Separate Engine drive—used one year—without truck.
1—2-2½ yd. Blaw-Knox Truck Mixer—Separate Engine drive—used one year—without truck.
11—4 yd. Transit Mix Bodies—excellent condition. Each $500.00.
1—80 ton 2 compartment Bin.
1—International Bulldozer, Model T-40, Diesel powered.
1—Speeder Crane, 55' boom, Model 192, powered 4 cylinder Hercules gas engine.
1—27E Multi-Foot Paver, Serial No. 4134, New York State specifications.
PUMPS—from 2" to 10" Jaegers—Self-Priming Centrifugal.
MIXERS—7S—10S—14S. Low Charge and Power Loaders—late models.
Trenching Machine—Compressors—Vibrators.
Spencer Dust Collectors—Hoists—Engines—Parts.
½ yard Speeder Crane—¾ yard Northwest Crane.
Orange Peel Bucket.

The JAEGER-LEMBO MACHINE CORP.
127-04 Northern Blvd. . . . . Corona, L. I., N. Y.
Phone: NEwtown 9-7777

THE CENTRAL FROG & SWITCH COMPANY

FROGS, SWITCHES, CROSSINGS, CROSS OVERS, SWITCH STANDS, RAIL BRACES. FISHPLATES & ANGLE BARS

TRACK EQUIPMENT
CINCINNATI, OHIO

GUARD RAILS, PORTABLE AND INDUSTRIAL TRACK OF EVERY DESCRIPTION. NEW & USED 12 LB. TO 70 LB. RAILS

HYDRATORS
3 Kritzer & Schultiess Hydrators.
AIR COMPRESSORS
BELTED: 255, 525, 674, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1722 & 2200 Ft.
DIESEL: 603, 807 & 1060 Ft.
PORTABLE GAS: 110,160,220,310,540 & 1200 Ft.
STEAM: 40, 310, 528, 1300, 2200 & 3600 Ft.
CLAMSHELL BUCKETS, SKIPS & GRAPPLES
Owen R A & H Stone Grapples.
2 Yd. OWEN Type S Material Handling.
1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
48 Steel Skips 6¼ x 6 x 2½.
5 Ton Bucyrus Rack Grabs.
CRANES AND DRAGLINES
¾ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.
25 Ton BROWNING & 20 Ton AMERICAN Loco.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
CATERPILLAR SHOVELS
¾ Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
¾ Yd., 1¼ Yd.,2 Yd. & 4 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas.
1¼ Yd. LIMA Diesel.
1½ Yd. BUCYRUS 41B Steamer.
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.
DUMP CARS
46—KOPPEL 1¼ Yd. 24 & 30 In. Ga.,V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd.,12 Yd., 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd.Cap.
15—Std. Ga. 80 Ton Battleship Gondolas.
FLAT CARS
9—50 ton std. ga. heavy duty flat cars.
HOISTING ENGINES
Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 35, 80, 100 & 150 HP.
Steam: 6¼x8, 7x10, 8¼x10, 10x12, 12x14.
DIESEL UNITS
75, 90, 180, 240 HP F. M. Engines.
110 HP Ingersoll Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.
BALL, ROD AND TUBE MILLS
6x9 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 5x8 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
2½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.
PULVERIZERS
JEFFERY 24x20 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 2.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 2 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 ft.Chaser M.
STEEL STORAGE TANKS
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.
MATERIAL BIN
110 Ton Blaw Knox 2 Compt.
400 BARREL CEMENT BIN
400 Barrel Butler Portable Steel Cement Bin with Fuller automatic batcher, push button control
SEPARATORS AND COLLECTORS
8, 10 and 14 ft. Separators, Gayco & Bradley.
ROLL CRUSHERS
36x60 Fairmount & 36x20 Diamond.
JAW CRUSHERS
10x8, 12x7½, 14x7, 15x9, 15x10, 16x9,16x12,16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12,30x15,30x13, 36x15, 36x30, 36x18, 36x14, 36x9,36x6,36x10,36x24, 42x9, 48x42, 48x36, 60x42, 84x66, 96x16, 9x36.
CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
5 No. 19, 25, 27 & 49 Kennedy.
18 in.,24 in.,30 in.,36 in.and 48 in.Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 8 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch.
8 in. Traylor T. Gyratory.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 12 Inch Superior McCullys.
SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275 v.
200 K.W.RIDGWAY 3/60/2200-250-275v.,900 rpm.
SLIP RING MOTORS
5½ H. P. GEN ELEC. 3/60/440 v., 1200 rpm.
(3) 100 H.P.GEN.ELEC.3/60/440v.,900-1200 rpm.
CONVEYOR PARTS
BELT: 1000 Ft.60 In.,700 Ft.40 In., 600 Ft.36 In., 800 Ft.30 In.,1642 Ft.24 In.,517 Ft.20 In., 297 Ft.18 In., 500 Ft.16 In.,300 Ft.14 In.
IDLERS: 54 In.,42 In.,36 In.,30 In.,24 In.,20 In.,18 In.,16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft.24 In.,30 In.& 36 In.Sections.
ROTARY DRYERS AND KILNS
36 In.x20 Ft., 3 Ft.x20 Ft., 4 Ft.x20 Ft., 54 In. x 30 Ft.,42 In.x24 Ft.,5 Ft.x20 Ft.,5 Ft.x16 Ft.,5 Ft.x60 Ft.,6 Ft.x60 Ft.,6 Ft.x20 Ft., 6 Ft.x70 Ft.,10x20,7½x100 & 8x110 Ft. Kilns.
STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom,25 Ton 100 Ft.Boom,75 Ton 135 Ft.Boom.
LOCOMOTIVES
GASOLINE: 2 Ton,5 Ton,8 Ton,12,14,and 20 Ton.
STEAM: 9 Ton,20 Ton,40 Ton,60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
DIESEL: 4, 8 & 15 Ton.
SCREENS
VIBRATING: 2x4, 3x6, 12x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72 & 6x12, 1, 2 & 3 Deck.
HUMMER, ROTEX, NIAGARA & ROBINS.
REVOLVING: 2x12, 2x16, 2½x18, 3x24, 4x16,4x20, 4x22, 4x24, 5x30, 5x20, 6x20.

TIDEWATER EQUIPMENT & MACHINERY CORP.
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New York, N. Y.

BARGAIN PRICES
ON
RUBBER BELTING
TRANSMISSION—CONVEYOR—ELEVATOR
"V" BELTS
FOR
PUMPS—CRUSHERS—PULVERIZERS—ETC.
RUBBER HOSE
FOR
AIR—WATER—STEAM—ETC.

Partial Stock List
NEW AND HEAVY DUTY
Conveyor and Elevator Belting

Quantity	Width	Ply	Top Cover	Bottom Cover	Type
668 Ft.	36"	6	1/8"	1/16"	Conveyor
660 "	30"	6	1/8"	1/16"	"
245 "	26"	5	1/8"	1/16"	"
906 "	24"	5	1/8"	1/32"	"
298 "	24"	4	1/8"	1/16"	"
370 "	22"	8	1/16"	1/16"	Elevator
296 "	22"	8	Friction		"
1455 "	20"	5	1/8"	1/32"	Conveyor
403 "	20"	4	1/8"	1/16"	"
1738 "	18"	4	1/8"	1/32"	"
60 "	18"	8	1/4"	1/16"	Elevator
288 "	18"	6	1/8"	1/16"	"
712 "	18"	4	1/16"	1/16"	Conveyor
1096 "	16"	4	1/8"	1/32"	"
554 "	16"	4	1/16"	1/32"	"
738 "	14"	4	3/32"	1/32"	"
288 "	14"	4	1/8"	1/16"	"
110 "	12"	8	1/8"	1/16"	Elevator
226 "	10"	6	1/16"	1/16"	"

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440 Ft.	48"	8	1/8"	1/16"	
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Conveyors—24"x40'-50'-60'-80', inc. portables.
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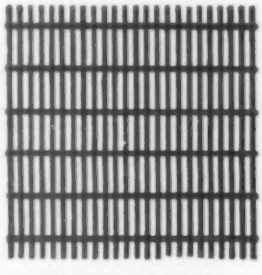

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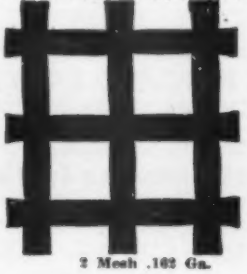

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One is Coöperation and the other is Coercion. Those who have made the International Crisis are using Coercion. In this country we propose to use Coöperation.

There's a vast difference between the meaning of these two words—just as there is a vast difference between our political inheritance and theirs.

That's why *voluntary* associations have always played a large part in our history. They are essential to maintenance of our liberties because they are natural vehicles of coöperative expression and action.

Fellow citizens who make your livelihood in these industries! It is your duty and it will prove your pleasure and profit to attend the 1941 conventions of your industry.

Silver Anniversary Convention of the **National Sand & Gravel Association**

held in conjunction with Eleventh Annual Convention of

National Ready Mixed Concrete Association

Netherland Plaza Hotel, Cincinnati, Ohio

JANUARY 15, 16, 17, 1941

Twenty-fourth Annual Convention of **National Crushed Stone Association**

Netherland Plaza Hotel, Cincinnati, Ohio

JANUARY 20, 21, 22, 1941

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For the main surface lines connecting holes and rows of holes, use Plain Primacord. It is light in weight, flexible, waterproof, and sufficiently resistant to abrasion—ideal for this service.

The continuous main line can be made up of separate lengths, each connection being a *square* knot, as shown. This type of connection should be used above ground only—*never in a bore hole.* In fact, it is advisable to see that the Primacord used in a bore hole is one continuous length, without joints of any kind.

Primacord-Bickford Detonating Fuse, used correctly, increases blasting efficiency and decreases cost and hazard. Write for bulletins.

PRIMACORD-BICKFORD *Detonating* FUSE

THE ENSIGN-BICKFORD CO., Simsbury, Conn.

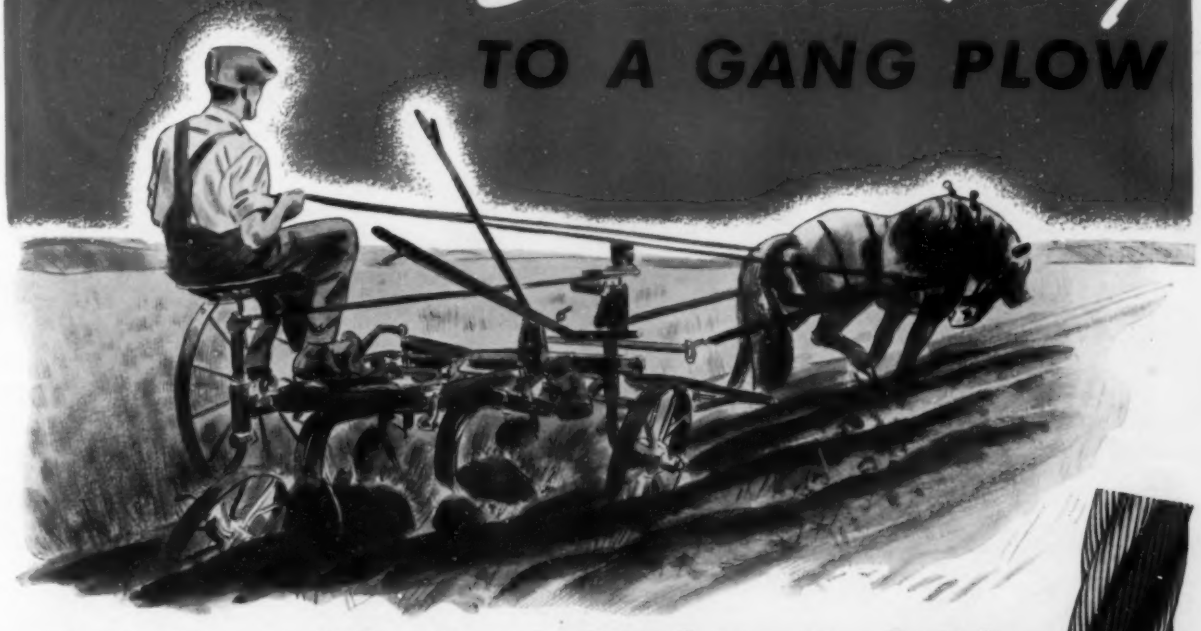
Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836

PB25

1. Tie through cartridge.
2. Half hitch branch to main line.
3. Connect main line lengths with square knot.
4. Fuse and cap on end of main line.

IMPORTANT: Branch lines should lead away from main lines at *right angles.* Avoid kinks and small loops.

YOU WOULDN'T HITCH A *Shetland Pony* TO A GANG PLOW



Don't Expect Wire Rope to Work Too Hard, Either

When you overload wire rope you reduce its safety factor and thereby limit its efficiency and shorten its life. Wire rope that doesn't have an adequate factor of safety (the ratio between the rated breaking strength of the rope and the load applied) can't bend as it should and fatigues rapidly. On the other hand, when a wire rope has an adequate factor of safety its service life is materially increased. For instance, a rope having a safety factor of 6 often lasts twice as long as the same rope having a safety factor of only 4.

Preforming Helps Maintain the Safety Factor

In ordinary wire rope there is frequently unbalanced strand tension which causes "high" or "low" stranding. Preforming wire rope largely eliminates this condition and leaves each strand free to bear its full part of the load. Thus **TRU-LAY Preformed Wire Rope** frequently helps maintain the original safety factor.

American Cable engineers are glad to recommend the proper rope for your needs. They know the minimum safety factor for all applications (determined after many years of laboratory testing and field work) and recommend ropes they know will give the greatest dollar value. Let us help you with your wire rope problems—of course, without obligation.

Green Signifies Go Ahead for Preparedness

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District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

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Proven by over 2,000 10-B's

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